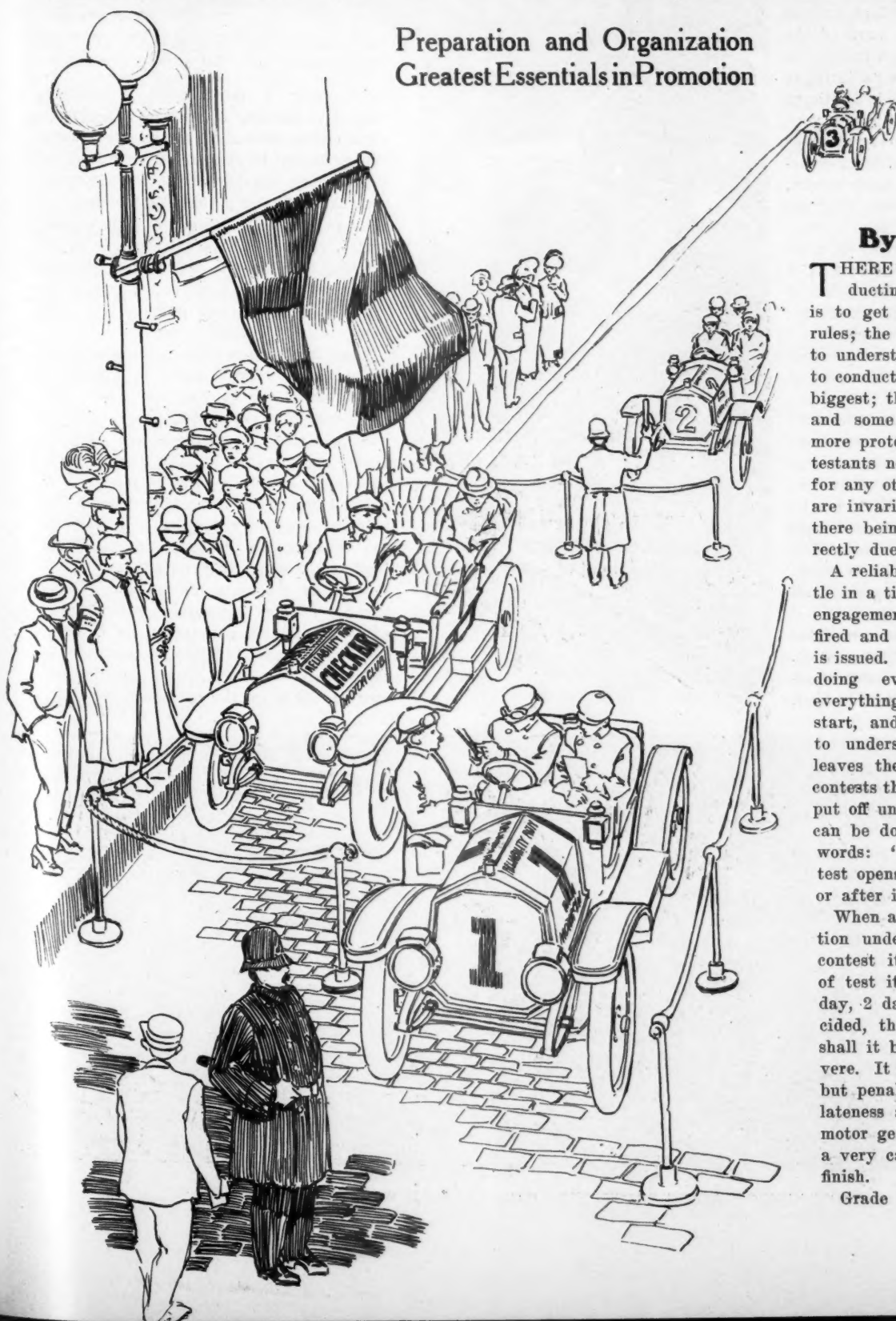


MOTOR AGE

The A B C of a Modern Reliability Run

Preparation and Organization
Greatest Essentials in Promotion



By David Beecroft

THERE are three big problems in conducting a reliability contest; the first is to get the officials to understand the rules; the second is to get the contestants to understand the rules; and the third is to conduct the test. The first two are the biggest; the third calls for common sense and some executive ability. There are more protests caused by officials and contestants not understanding the rules than for any other six causes; in fact, protests are invariably the outcome of ignorance, there being few cases where they are directly due to inefficiency.

A reliability contest is much like a battle in a time of war; it is won before the engagement opens, before the first shot is fired and often before the first command is issued. It is all a case of preparedness, doing everything beforehand, getting everything ready before the morning of the start, and, above all, getting everybody to understand everything before a car leaves the official garage. In reliability contests the only rule to follow is: "Never put off until after the contest starts what can be done before it starts." In other words: "Read the rules before the contest opens and not while it is in progress or after it is over."

When a motor club or any other association undertakes to conduct a reliability contest it should first decide what kind of test it wants. Whether it will last 1 day, 2 days, 3 days or 6 days. This decided, the next question is which grade shall it be. Grade No. 1 is the most severe. It is of fewer than 6 days' duration, but penalizes for work done on the road, lateness at controls, final outdoor test of motor gearset and clutch and brakes, and a very careful technical inspection at the finish.

Grade No. 2 is a test of over 6 days'

duration, but in practically all other respects is like Grade 1. Grade 3 is easier. It penalizes for work done on the car on the road and for lateness at controls, but there is not any final outdoor test or technical examination. Grade 4 is the easiest of all, and arranges only for penalties for lateness at controls.

Deciding the Grade

The capabilities of the club alone can determine the grade of contest to be conducted. Grades 1 and 2 call for a big organization and experienced officials; they necessitate an efficient technical committee, a competent contest committee and experienced checkers and observers. Both of these tests include clutch and brake tests as well as final examinations, and all of these presuppose, on the part of the technical committee, a thorough knowledge of car construction as well as an intimate knowledge of all cars entered. Both of these grades of contests call for a very thorough system permeating every phase of the contests, because generally manufacturers compete, it costs them much money, and they expect and should have only the very best of service.

The first step in the promotion of a reliability contest is the appointment of a contest committee. It should consist of not fewer than seven persons and a greater number is better. This committee should appoint sub-committees, such as printing committee, route committee, entry committee, trophy committee and publicity committee. By the appointment of several sub-committees, each under a competent chairman, the work of the main contest committee is distributed over a number of persons and quicker and better results are accomplished. The sub-committees are given various duties to perform, as enumerated later, and they are expected to report to the main committee their progress at all meetings.

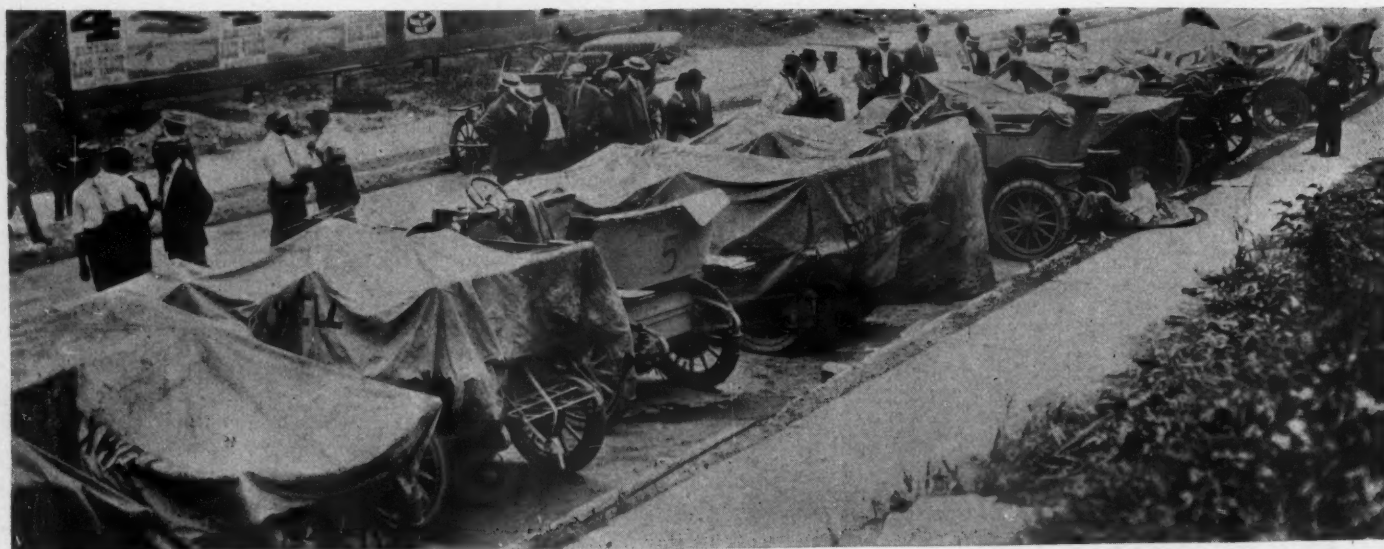
The first task of the contest committee is the general organization of the contest. To begin: A route must be selected. Suggestions from local dealers are often best,



SUGGESTED SIGNS FOR DIFFERENT CARS IN TOUR

particularly if the contest is primarily staged to develop interest in the car and so stimulate trade. If possible the contest route should be mapped out to embrace the greatest number of centers of population throughout a given area, be that area a single state like Illinois or half a dozen states, as might be the case in a 5-day run starting from Boston, Mass. It all depends on the size of the state and where the dealers distribute, and perhaps where the good roads movement is needed.

Once the route is settled, and this should be not fewer than 6 weeks in advance of the start of the contest, and much more if possible, a pathfinding car should be selected, that is, a car to go over the route, get the exact route directions for the entire circuit, so that a book can be printed and given to each contestant, this book telling every turn in the road and the distances at all turns, cities, special landmarks, etc. This pathfinding car is secured by the route sub-committee and a member of this committee should accompany it on the pathfinding trip, which should be made 1 month in advance, so that companies that intend entering the contest will know the route and the length



THE ROPED-OFF NIGHT PARKING SPACE, WITH CARS COVERED WITH TARPAULINS



SUGGESTED METHODS FOR SIGNS AND PACEMAKERS' FLAG

of each day's trip. It is rather difficult to get companies to enter contests before they know where they are going to go, although some clubs think they should. They soon learn differently.

The Pathfinding Trip

When the pathfinding car is on its preliminary trip all arrangements should be made for garage accommodations at the night stops for the contesting and official cars. The best plan is to engage an entire garage if there are over twenty-five entries in the contest. This can be done by a nominal fee of 50 cents or a dollar per car, which is paid for by the contestants themselves. Hotel accommodations should also be made. Inquire for the hotel rates in the different rooms and the number each hotel can accommodate. Get these figures in writing and also arrange for breakfasts at 6 or earlier, which is imperative, if a 7 o'clock start is to be made. On the pathfinding trip is the only proper and safe time to make these arrangements.

On the pathfinding trip arrange for gasoline and oil at the garages for night stops. If the garageman can, have him supply both; if not, arrange with some of the

large gasoline and oil dealers. Where twenty-five cars want gasoline at the same time it is rare that any garage has sufficient facilities to handle them in the time at hand. After a long day's run the drivers are tired, and although given 45 minutes to oil up the car they do not want to wait another 45 minutes or hour for the gasoline man to come around. To avoid this let the garageman have a lot of 5-gallon cans ready filled with gasoline in addition to the hand tank with pump and hose which he may have. The same precautions apply to oil. Twenty-five drivers may want oil at the same time and the garageman may think he has made handsome arrangements if he has appointed one man to care for the oil. Such cannot be done. There should be at least three men on gasoline and two on oil; the garage manager himself should be on hand to collect from the drivers for all gasoline and oil purchased.

Much Printing Needed

As soon as the route committee has finished its circuit of the course it should turn over its entire route description to the printing committee, who has it printed in neat and handy book form. A paper covered book 4 inches wide and 8 inches long is best. Another work of the committee is getting the confetti ready. It can be purchased from any printing house. It is made from red, blue, green and white paper cut up in strips about one-quarter inch wide and a foot or more long. There should be $\frac{1}{2}$ pound for every mile of course, unless there are a great many turns. This should be put up in bags of 50 pounds each, and these bags should be expressed to the different night stops and to the noon controls. This should be done 10 days in advance and the committee should insist on an acknowledgement of receipt from the express company or other party to whom it has been expressed, otherwise when the pilot car is on the run it may find that the confetti has not arrived and the start of the contest may



THE PARKING SPACE ALONG THE SIDEWALK IS ROPED OFF, FORMING AN ENCLOSURE

BOTH SIDES OF TECHNICAL INSPECTION CARDS

NOVEMBER 7, 1910

Car No. 77 Class 4A
Midland
 Passengers 2

Driver G. E. Game
 Observer H. Anderson

CHICAGO

Leaving Time 10:32 A. M. Started 10:32 A. M.

45 minutes will be allowed at Rockford for lunch and the taking on of gasoline, oil and water. Observer will note below the length of stop at Rockford. Note on back cover hereof amount of gasoline, oil and water taken on.

ROCKFORD
 (Checking Station—Cars must not arrive ahead of "due" time.)

Due 2:32 M.
 Revised Due M.
 Revised Due M. Arrived 2:32 M.
 Revised Due M. Started 3:30 M.

MOLINE.

Due 8:39 P. M.
 Revised Due 8:46 P. M.
 Revised Due P. M.
 Revised Due P. M. Arrived 8:05 P. M.

Observer and driver must not leave car until same has been delivered to chief observer after lubrication, etc., ready for next morning's start.

REMARKS.
Held up 4 minutes
by train at Elgin.

This is an accurate record of above car in this day's run.
 Nov. 7, 1910. H. Anderson
 Observer.

PENALIZATIONS AND CAR RECORD

Observer should mark everything that takes place during day, all work done on car, breaking of seals, time consumed for work and all details called for by the Rules of Contest (replacements, adjustments, motor stops, broken seals, etc.).

Don't Mark Here

Stopped 6 minutes
 10 miles out to
 put in gasoline 3

Stopped 1 minute
 40 miles out to
 tightened spring
 clip nut, 2
 men working 2

Stopped motor 7
 minutes at
 106 miles to cool off 7

Stopped 12 minutes
 to loosen rear
 brake, 2 men
 worked 11 minutes
 each 22

Put new needle
 valve in carburetor
 1 man 7 minutes 14

Total 48

I agree that record of above car as shown on this card is correct.
 Nov. 7, 1910. G. E. Game
 Driver.

SECOND AND THIRD PAGES OF SUGGESTED OBSERVERS' CARDS

produced herewith and they will serve as excellent guides. The first form required is the observers' cards. These are four-page cards which fold in the center and resemble the cover of a book. They are made of waterproof cardboard with the halves held together at the hinge by heavy strips of linen. On the front cover of these cards are the directions of the observers. Every rule that an observer has to bother with should be printed hereon. The second page, or the inside front cover, if we may use the expression, contains the running time of the car, the hour of starting, when due at the noon or other controls and when due at the night control. The top of the page shows the official number of the car, the name of it, the driver, the observer and the number of passengers.

The time the car should leave has to be entered in ink before the start, preferably the evening before; so also should the other running times and when due at controls. Spaces are left after the words Revised Due; these are to take care of delays caused by tire troubles. To explain, if a car were due at Moline, the night control, at 8:39 and it lost 7 minutes due to tire troubles, then the observer would add this to the running time and so make the car due at 8:46. This is imperative be-

FIRST ANNUAL
 Wisconsin State Automobile Association
 Reliability Tour
 MILWAUKEE SENTINEL TROPHY,
 JULY 18-22, 1910.

Checker's Schedule 5th day, July 22, 1910, Control at Waupaca

No.	CAR	DRIVER	OBSERVER	Arrived	Departed	Late
1	Rambler					
2	Rambler					
3	Badger					
4	Badger					
5	Mitchell					
6	Cadillac					
7	Jackson					
8	Buick					
9	Buick					
10	Kissel Kar					
11	Kissel Kar					
12	Kissel Kar					
14	Pierce-Bacino					
15	Johnson					
16	Ohio					
17	Pope Hartford					
18	Reo					
19	Curkin					
20	Ford					
21	Franklin					
22	Overland					
23	Staver					
24	Petrol					
25	Warren-Detroit					

Official Checker.

REMARKS:

Car No.

Official Checker.

RULES GOVERNING THE **1000-Mile** **Reliability Contest**

of the
CHICAGO MOTOR CLUB
to be held

November 7, 8, 9, 10 and 11, 1910

THIS Grade I reliability contest for gasoline pleasure cars will start from the headquarters of the Chicago Motor Club, New Southern Hotel, corner Michigan Ave. and 13th St., Monday A. M., and will continue for five consecutive days, with runs of approximately 200 miles per day, and embracing over fifty of the largest cities and towns in Illinois, Southern Wisconsin and Eastern Indiana. The night stops for the first four days of the run will be in large cities in the state, the contestants not returning to Chicago until Friday, November 11, at the end of the run. There will be one trophy for the winner in the touring-car class; a trophy for the winner in the runabout division; a trophy for the contesting car, irrespective of class or division, making the best gasoline economy performance under the Chicago Motor Club formula; and there will be a tire trophy for the best tire performance.

The run will be conducted under the 1910 contest rules and sanction of the American Automobile Association.

SUITABLE BOOK FOR RULES

cause the 1911 rules require all time lost in tire repairs to be added to the day's running time if the motor is kept running while the tire repair is being made.

On page 3 of this observers' card are many blank lines on which the observer must record his observations. If the driver has to stop to change a spark plug it must be recorded here, together with the number of minutes required to do it. The same is true of every other work that has to be done. It should be recorded while the work is being done or immediately afterwards, and the time required should be told the driver as soon as complete, so that after disputes cannot arise.

On page 4, or the back cover, are spaces for recording the amount of gasoline, oil and water taken on at the different controls. The observer has to make these records. Below these are several lines in which to record all the tire repairs, with the time required for each and the exact nature of the repair, whether repairing a puncture or blowout, or merely inflating more or reducing the pressure. At the bottom of the page are more lines on which the observations on other cars are recorded. These should show every car seen in trouble and what appeared to be the repair in progress and the mileage at that point. Each page of the observer's card should measure 10 by 5 1/4 inches.

Technical Committee Cards

The technical inspection cards are important and are illustrated. The front side of each is for the preliminary inspection and the reverse for the final inspection.

The preliminary inspection must be made by the technical committee with a representative of the car. Each part of the car is checked over and if any parts are out of order, sprung or deranged this must be recorded so that the car will not be penalized for these at the completion of the contest. It is most important that this be carefully done; every care should be exercised to see that everything is stock as recorded in the registered stock car description of the car. Protests are avoided by having this preliminary work well done.

On the reverse of the card are spaces for the results of the motor, clutch and brake tests. There is also room for recording what parts are broken or damaged. At the bottom of the card on each side is a space for the car representative to sign, which shows that he has watched the examination and agrees with it in every respect. These cards are generally white cardboard and cut 10 inches long and 5 inches wide. They are the possession of the technical committee throughout the contest and until the official returns are made to the referee, when they should be turned over to him.

The checkers' cards are great savers of trouble. The front of the card shows the numbers and names of all of the contesting cars with vertical columns in which the checker records the time the different cars check through his control and the

GOOD ROADS TOUR **FOURTH DAY, THURSDAY, OCTOBER 28.** **STAUNTON TO ROANOKE, VA.** **92 MILES.**

- 0 Leaving the Hotel Beverly go east and follow trolley with several turns.
- 2 Cross the railroad, and just beyond go under a viaduct and keep straight ahead with trolley.
- 1.1 Pass road to right.
- 1.6 At the fork take the right road following the main line of wires, and just beyond cross railroad.
- 3.7 At the fork, with small tree in the angle, take the right road.
- 5.2 Pass road to left.
- 7.1 Pass road to left at MINT SPRING post-office.
- 10.2 Pass crossroad.
- 10.8 Cross railroad.
- 11.4 Pass crossroad.
- 12.5 Cross small iron bridge into GREENVILLE.
- 18.7 Pass crossroad at MIDWAY post-office.
- 20.9 Pass road to right.
- 21.2 Cross small iron bridge.
- 24.6 FAIRFIELD.
- 27.2 Pass road to left.
- 29.6 TIMBER RIDGE; at the fork with red brick church on right and stone church on left, take the right road down hill.
- 30.5 Cross small wooden bridge.
- 30.8 Pass road to left.
- 31.6 Cross small ford and bear left.
- 35.5 At the end of the road turn left.
- 35.7 Turn sharp right under covered bridge.
- 35.8 Go under railroad trestle and cross railroad side-track and small iron bridge.
- 36.9 LEXINGTON (Hotel Lexington).
- 39.6 At the fork take the left road down hill.
- 40.8 At the fork take the left road crossing small ford.
- 42.1 At the end of road turn left down hill.
- 43.4 Cross iron bridge and just beyond turn right up hill.
- 43.6 At the fork take left road with wires.
- 44.5 Pass road to left.
- 44.6 Pass road to left.
- 45.6 Pass road to right.
- 47.6 Pass road to left.
- 49.8 At the fork keep to the left.

SPECIMEN PAGE OF ROUTE BOOK

time they start. There is a third column in which lateness of arrival is recorded. On the reverse of the car are blank lines on which the checker can record notes such as violations of the rules he has observed or make statements relative to disputes over time of checking in, order of checking, etc. After the cars are all checked through the checker gets his card to the night control, where it is turned over to the chief checker, so that he can make out the time scores for the day, giving the penalties for lateness that may have been incurred. At each control the checker also enters the time of arrival and departure on the observer's card, but it might be altered and so could not be taken as the official record.

The driver's card is often considered unnecessary, but it is far from being such. It is virtually page 2 of the observer's card and shows the time of starting, time due at different controls and time of leaving. There are also revised due times. This card is held by the driver and his mechanic and is their guide for the trip. The information could be obtained from the observer, but this has led to disputes and confusion and for the little additional expense it has been deemed advisable to use the driver's card in addition to the observer's card. It is the same size, namely, 10 inches long and 5 inches wide.

Numbers on Cars

A big task for the printing committee is getting numbers for the cars and badges for the officials. The rules call for both the official number and the car name on

NOVEMBER 7, 1910

No. 119 Car Moline Class 3-A

DRIVER Salisbury

OBSERVER _____

Running time 18 miles per hour. _____ miles in cities

CHICAGO—0.0 Miles.

Leaving Time 6:31 A. M. Started 6:31 A. M.

Starter _____

ROCKFORD—86.3 Miles. [Noon Control, 45 Minutes Stop
MUST NOT ARRIVE AHEAD OF "DUE" TIME

Due 11:08 M. 11:53

Revised Due _____ M. Arrived 10:40 M

Revised Due _____ M. Departed 11:31 M

Revised Due _____ M.

Checker. _____

MOLINE—193.6 Miles.

Due 5:36 P. M.

Revised Due _____ P. M. Arrived 4:05 P. M.

Revised Due _____ P. M.

Revised Due _____ P. M.

M.B.

THE DRIVER'S RUNNING CARD, SHOWING
STARTING AND ARRIVING TIMES



THE CONFETTI SHOULD BE PUT IN 50-POUND BAGS

each contesting vehicle. The official number should be painted in large numbers on the radiator, on each side of the bonnet and on the back of the tonneau. The numbers should be 10 inches high. The name of the car should be painted across the top of the tonneau door and across the back of the tonneau in letters 4 inches high. In runabouts it can be painted across the ends of the seats. On the hood should be painted the name of the contest and the promoting club in letters 3 inches high. It is best to have all of these painted on with a soluble paint, which can be washed off when the run is over. A sign painter must be engaged to do the work and it should be done in the headquarters garage the day before the contest starts.

Where a club does not wish to have the numbers painted on heavy white duck signs can be painted and tied by strings to the cars. These signs flutter a great deal in the wind, frequently break loose and can very rarely be read. All told, it is much more satisfactory to use the paint. In addition to the signs for contesting cars there are other signs needed. On the different official cars are needed the words Pilot, Pacemaker, Referee, Chief Checker, Technical Committee, Press and Non-Contestant.

The printing committee must also arrange for flags for the checkers and the pacemaker. The checker's flag is a white field with a diagonal red bar 3 or 4 inches wide. The flag should be at least 4 feet by 6 feet and can be made from ordinary cheese cloth. It must be mounted on a stout staff so that it can be hung from a telegraph pole or the side of a building well in the air, so that the contesting cars can readily see it when arriving in strange towns and cities. The pacemaker's flag is a blue ground with a white diagonal bar 4 inches wide. The flag should be

large enough to cover the rear of the tonneau, as illustrated, so that contesting cars can easily see it. It should have an eyelet in each corner so that it can be tied in place and kept there during the tour.

Lastly, and it is scarcely necessary to mention, the printing committee must get the badges for the officials, for the drivers and for the observers. The best driver's badge is a button 2 inches in diameter, with the number of the car in the center, surrounded by the name of the contest, the promoter and the date. These buttons should be of one color, preferably red. For the observers have similar buttons, with the word Observer in large letters across the center, and having the name of the contest and the promoter on also. Arm bands or brassards are best for the referee, checkers, technical committee and contest committee, pilot, etc.

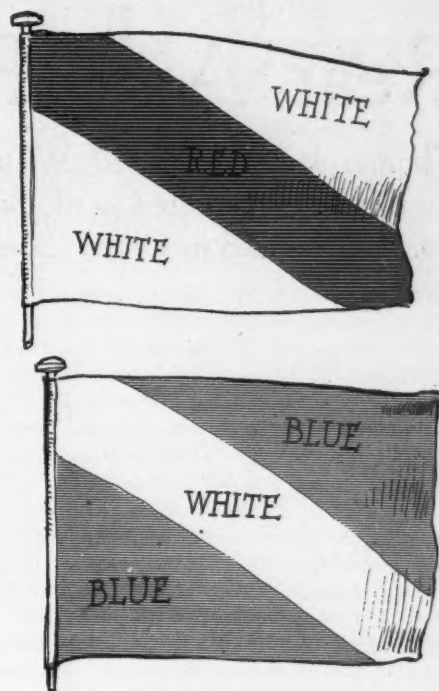
The rules and entry blanks should be printed 6 weeks before the start of the contest. The A. A. A. rules are specific on these and can be followed to the letter.

The Publicity Item

The work of the publicity committee should be carefully carried out if the full measure of success of the run is to be obtained. It is not enough that the citizens of the town or city in which the promoting club is located know all about the contest, but all of the towns and cities in the entire route should be kept posted on the work. The daily and weekly papers throughout the entire route zone should be informed of every detail of the run as well as the list of entries and the official numbers that the different cars will carry. In this way the tour is a recognized quantity as it makes its daily itinerary and is not going among people who do not know anything about it.

With a competent trophy committee it is an easy matter to get enough prizes for the winners in the different divisions. This committee should do its work more than 1 month in advance of the opening of the test, so that the trophies are on hand while the entries are being received, and so the contestants will know what they are to compete for. In accepting trophies it is generally best to accept only trophies that are won outright, as compared with those that have to be won three times. Unless a trophy is very valuable, costing \$1,000 or more, it should be contested for but once.

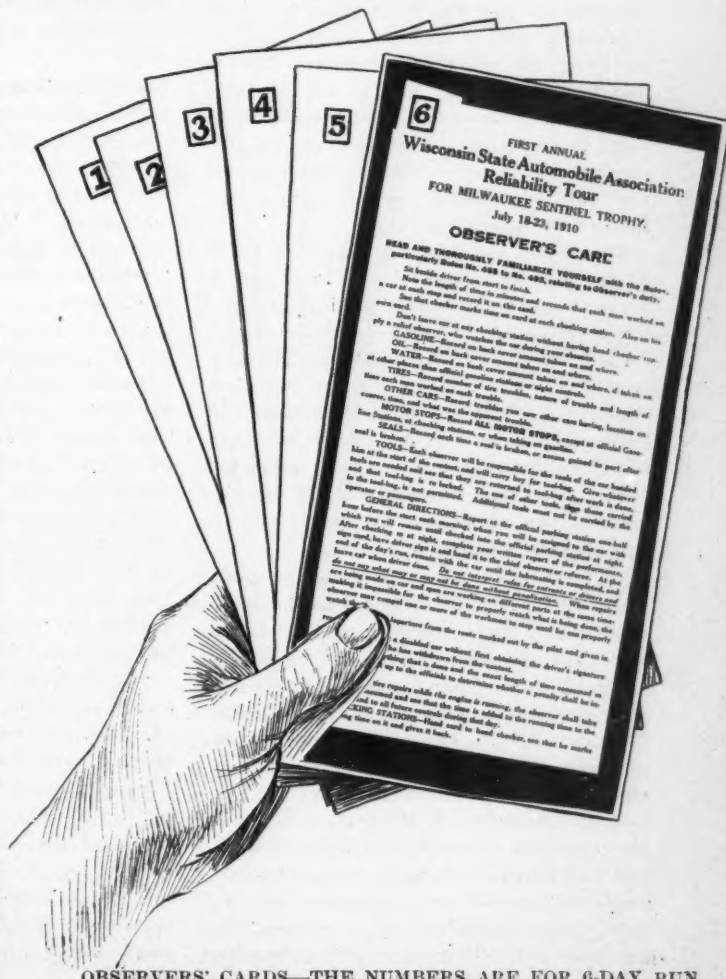
One detail that the tro-



CHECKER'S FLAG ABOVE, PACEMAKER'S FLAG UNDERNEATH

phy committee frequently overlooks is the awarding of certificates of performance which are given to each car completing the contest. These are engrossed certificates, generally 12 by 16 inches in size, and give the exact standing of the car. They are official documents.

(Continued on page 35)



OBSERVERS' CARDS—THE NUMBERS ARE FOR 6-DAY RUN

Rear Axle Patent Now in the Courts

Thomas J. Lindsay and Willard Harmon Start Suit Against Cadillac Automobile Co. of Indiana—National Motor Vehicle Co. and Timken in Other Cases Brought by the Two Partners.

INDIANAPOLIS, Ind., March 28—Suit has been entered in the circuit court of the United States for the district of Indiana by Thomas J. Lindsay and Willard Harmon against the Cadillac Automobile Co. of Indiana, a concern selling motor cars in Indianapolis and adjacent territory. The suit is for alleged infringements of patents held by Lindsay on rear axle construction for motor cars. The suit charges violation of the following patents held by Lindsay, namely: No. 612,360, dated October 11, 1903; also No. 748,760, dated January 5, 1904; also No. 788,661, dated May 2, 1905; also a re-issue No. 12,387, dated May 29, 1905. These patents cover a revoluble spring seating on an axle housing and also a method of loading axle construction whereby the driveshafts of the axles may be withdrawn without disconnecting the axle housing from the car body, and so the differential may be removed without disconnecting the body from the axle housing.

In the suit filed against the Cadillac Automobile Co. of Indiana, Lindsay and Harmon ask that the court grant a writ of injunction perpetually enjoining and restraining the defendant from any further manufacture, sale or use, in any manner, as said structures for motor vehicles, or part thereof, and, further, that the defendant may be compelled to account for and pay over profits derived from manufacture and sale of such.

This is not the first that has been heard of the Lindsay patents. As long ago as 5 years suit was brought against the National Motor Vehicle Co. of Indianapolis for infringement of these patents. The case is still in court and no decision has been rendered. It is understood a decision will be demanded by the defendant within a month. The evidence was all completed over 2 years ago, but the plaintiff has not yet had the case called in court.

Suit Against Timken

Still another connection in which these patents have figured is in connection with the Timken Roller Bearing Axle Co. On March 24, 1904, Lindsay and Harmon, co-partners, by a device given out, entered into a contract with the Timken Roller Bearing Axle Co., Canton, O., whereby the company was to manufacture the axles on royalty basis. This contract continued on uninterruptedly until 1907, when the Timken company brought suit against Lindsay and Harmon, charging that they were about to manufacture axles, and seeking to enjoin them from manufacturing the axles or permitting any other manufacturer to make them. Pending this suit

the Timken company was directed by Judge Landis of the federal court to pay royalties into the court during the suit, and \$4,000 was so paid in. Later, however, Judge Albert D. Anderson set this order aside.

Lindsay and Harmon filed a cross bill to the complaint in which they asked that the contract be set aside and asking an accounting of royalties. The Timken company then set up a claim that it could not be held responsible for royalties after a certain date, because it had quit manufacturing the axles, the business being taken over by the Timken-Detroit Axle Co., and the business was transferred to Detroit.

The issues were placed in the hands of Edward Daniels, master in chancery, who, in filing his report with the court, said in part:

"In so manufacturing and selling its so called 1908 type, 1909 type and 1910 type of axles and in failing to report and pay for the same under said contract of March 24, 1904, the Timken Roller Bearing Axle Co. was an infringer of said United States letters patent No. 612,360 and No. 718,760 included in said contract of March 24, 1904."

Views of the Master

The master also presented the following conclusions of law:

"First—The acts and conduct of the said Timken Roller Bearing Axle Co. were, in legal effect, a repudiation by it of said contract of March 24, 1904.

"Second—Thomas J. Lindsay and Willard Harmon having been brought into this suit in equity as defendants to the original bill of complaint, are entitled by their cross bill and the issues made thereon and the facts found as aforesaid to the equitable relief of rescission and cancellation by decree of court of said contract of March 24, 1904, notwithstanding the fact that they have a remedy at law for royalties or for infringement, and as an incident to such decree of rescission and cancellation they are also entitled to a decree against the Timken Roller Bearing Co. for an accounting to the date of the decree.

"Accordingly such a decree of rescission and cancellation of said contract of March 24, 1904, and for an accounting is recommended by said master in chancery."

The master's report was dated October 20, 1910, and upon this report Judge Anderson entered the following decree:

"This cause came on to be heard at this term and was argued by counsel; and thereupon, upon consideration thereof, it was ordered, adjudged and decreed as follows, viz.:

"First—That the bill of complaint in the original cause herein be and the same is hereby dismissed for want of equity, with costs to the defendant to be taxed.

"Second—That the contract of March 24, 1904, referred to and set forth in the master's report on the cross cause, by and between the Timken Roller Bearing Axle Co. and Thomas J. Lindsay and Willard Harmon be and the same is hereby rescinded, cancelled and terminated in all respects as of the date of this decree, and that all remaining rights in the patents and inventions referred to in said contract be and are hereby fully restored to Thomas J. Lindsay and Willard Harmon.

"Third—That the cross defendants, the Timken Roller Bearing Axle Co., by manufacturing and selling its so-called 1908 type, 1909 type and 1910 type of axles and in failing to report and pay for the same under the aforesaid contract of March 24, 1904, has become liable to pay the royalties provided therefor in this contract.

"Fourth—That the cross cause herein be referred to Edward Daniels, Esq., master in chancery of this court, who is hereby appointed to take and state an account of all bevel gear drive axles heretofore manufactured and sold by or for the Timken Roller Bearing Axle Co., including all bevel gear drive axles designated in this cause as 1908 type, 1909 type and 1910 type and not heretofore reported and paid for by the said Timken Roller Bearing Axle Co. to the said Thomas J. Lindsay and Willard Harmon, stating the time of sale of each of such axles; the amount of money which would have been due and payable therefor under the aforesaid contract of March 24, 1904, had the same been duly reported and paid for under said contract and the amount of interest at the rate of 6 per cent per annum upon each such amount from the due date thereof to the and including the date of decree.

"Fifth—That the said Thomas J. Lindsay and Willard Harmon do recover of the Timken Roller Bearing Axle Co. their costs in the cross cause of this suit to be taxed."

Timken Files a Report

The Timken Roller Bearing Co. has filed with the master in chancery a report showing that from April, 1908, to September, 1909, inclusive, the company manufactured 6,332 axles, the royalties upon which, at \$3 each, amounted to \$18,996. This report has not yet been acted upon by the master.

In 1905 Lindsay and Harmon brought suit against the National Motor Vehicle Co., charging that three points of one patent and three points of another patent had been infringed. This case is still

Speed Meet on the Jacksonville Beach

at issue and William Bosson, attorney for Lindsay and Harmon, expects to file a brief in the case in the next few days. This case also demands an accounting.

The following statement has been issued by the Timken company:

"In March, 1904, the Timken Roller Bearing Axle Co. entered into a contract with Lindsay and Harmon which gave to the Timken company the exclusive right to the use of the inventions covered by the Lindsay and Harmon patents upon the payment of certain royalties. Differences subsequently arose between Lindsay and Harmon and the Timken company in regard to its respective obligations under this contract and in September, 1907, a suit was brought in the United States court at Indianapolis to determine them, and in January, 1911, a decree was entered in this suit which provided, among other things, that the license to the Timken company under the Lindsay and Harmon patents should be canceled and that the Timken company should account to Lindsay & Harmon for royalties upon certain types of axles which differed materially from the earlier types made by the Timken company and which the latter claimed did not come within the contract.

Claims Decree is Erroneous

"The Timken company is advised and believes that the decree which has been entered in this suit is erroneous and is preparing to appeal from it to the court of appeals, and expresses absolute confidence in having it reversed, in which event the Timken company would of course remain licensed under the Lindsay and Harmon patents and its customers fully protected by such license. If, on the other hand, the decree should be affirmed the Timken company would then be in just the same position as numerous other manufacturers who have for years been making similar axles without any license under the Lindsay and Harmon patents, and who seem to have no fear of the latter. In this connection the Timken people call attention to the fact that Lindsay and Harmon brought a suit on these same patents against the National Motor Car Co. at Indianapolis in the year 1905, but have allowed the suit to drag along for more than 5 years without ever bringing it to trial, and apparently without any desire or intention that the court shall ever be allowed to pass upon their patents. The failure of Lindsay and Harmon to diligently prosecute this suit, which was brought as a test case on their patents, was one of the causes of the litigation which the Timken company began against them at Indianapolis. The Timken company has sent out a letter to its customers respecting the general situation and assuring them of its full protection against Lindsay and Harmon's claims."

No Records Broken First 2 Days, but Racing Is Interesting—National Carries Off Most of Honors, With Pope-Hartford Also Getting in Limelight—Warren, Mercer and Cole Win

JACKSONVILLE, Fla., March 29—Special telegram—Two days of racing on the Atlantic-Pablo beach have failed to make any changes in the straightaway record table, but the first meet of the Jacksonville Motor Club has been enjoyable just the same because of the keen sport. There has been some disappointment over the failure of the Jenatzy Mercedes to shatter any records, but really the car isn't to blame. The breaking of a piston ring in the 5-mile race yesterday resulted not only in the defeat of the German car by the National six, but it also put the car out of commission today.

So far it has been a duel between the National and the Pope-Hartford and today the former had the honors, although Disbrow distinguished himself yesterday by winning the hour race in his class and capturing the 100-mile race.

The meet was to have opened Monday, but the weather conditions forced a postponement and the card was run off yesterday. Today it was expected there would be something doing in the kilometer trials, but the beach was not in very good condition. The best flight was the kilometer in :19.26 by the Blitzen Benz. The record was :17.04, made by Oldfield in the same car at Daytona. The National won all the events in its class, while the Warren, Mercer and Cole won. Summaries:

EVENT 1, 5-MILE, CLASS B, 161-230 CLASS

Car	Driver	Pos.
Warren-Detroit	Tower	1
Warren-Detroit	Evans	2
Lancia	Rouse	3

Time, 4:24.12; average, 68.15 miles per hour.

EVENT 2, 5-MILE, CLASS C, 231-300 CLASS

Car	Driver	Pos.
Mercer	Hughes	1
Cole	Wilson	2
Cole	Tucker	3

Time, 4:14.45; average, 70.8 miles per hour.

EVENT 3, 10-MILE, CLASS B, 301-450 CLASS

Car	Driver	Pos.
National 40	Merz	1
National	Wilcox	2
Pope-Hartford	Disbrow	3

Time, 8:03.67; average, 74 miles per hour.

EVENT 4, 10-MILE, CLASS B, 401-450 CLASS

Car	Driver	Pos.
Cole	Wilson	1
Mercer	Hughes	2

Time, 8:16.35; average, 72.5 miles per hour.

EVENT 5, 10-MILE OPEN, CLASS D

Car	Driver	Pos.
National six	Wilcox	1
Buick Bug	Burman	2
Pope Special	Disbrow	3

Time, 7:00; average, 85.7 miles per hour.

EVENT 6, 10-MILE, CLASS D, HANDICAP

Car	Driver	Pos.
Mercer	Hughes	1
Cole	Wilson	2
Pope Special	Disbrow	3

Time, 8:00.54.

EVENT 7, 10-MILE, CLASS D, HANDICAP, POSTPONED FROM TUESDAY

Car	Driver	Pos.
National six	Wilcox	1
Pope Special	Disbrow	2
Cole	Wilson	3

Time, 6:55.53.

KILOMETER TRIALS

Car	Driver	Time
Blitzen Benz	Burman	:19.26
National six	Wilcox	:22.75

The first day was replete with surprises. Louis Disbrow, with the Pope-Hartford, captured the 100-mile event in remarkable time and his finish was one of the most spectacular ever seen in beach racing.

The 5-mile-free-for-all was closely contested. In the last mile Burman broke a piston, putting the Jenatzy Mercedes out of the running after having had a lead of over ½ mile on Wilcox, who won.

Charlie Merz, at the wheel of the big blue National 40, won the 20-mile race for cars of 600 inches and under.

The time trials for the kilometer were called off on account of the lack of wiring for the timing system. Summaries:

EVENT 1, 20-MILE OPEN

Car	Driver	Pos.
National 40	Merz	1
Pope Special	Disbrow	2
National six	Wilcox	3

Time, 14:48.43; average, 79.55 miles per hour.

EVENT 2, 100-MILE OPEN

Car	Driver	Pos.
Pope Special	Disbrow	1
Buick Bug	Burman	2
National six	Wilcox	3

Time, 1:15:25.39; average, 80.1 miles per hour.

EVENT 3, HOUR RACE, 451-600 CLASS

Car	Driver	Pos.
Pope Special	Disbrow	1
National six	Wilcox	2
National 40	Merz	3

Distance,

EVENT 3, HOUR RACE, 231-300 CLASS

Car	Driver	Pos.
Mercer	Hughes	1
Case Special	Strang	2
Cole	Wilson	3

Distance, 80 miles in 1:05:54.37.

EVENT 3, HOUR RACE, 161-230 CLASS

Car	Driver	Pos.
Warren-Detroit	Tower	1
Cole	Tucker	2

Distance, 64 miles in 1:12:11.13.

EVENT 4, 5-MILE FREE-FOR-ALL

Car	Driver	Pos.
National six	Wilcox	1
Mercedes	Burman	2
Pope Special	Disbrow	3

Time, 3:13.27 from standing start; average, 93.31 miles per hour.

LOZIER TEAM FORMED

Detroit, Mich., March 25—The announcement was today made by the Lozier Motor Co. that Lozier cars will compete in all of the national circuit events of the season. The Lozier team will be seen in the opening event of the national grand circuit in the 500-mile race at Indianapolis May 30. This team will consist of three drivers, Ralph Mulford, Teddy Tetzlaff and Harold Van Gorder. Dr. Chambers, of McKeesport, Pa., is backing Van Gorder in his racing campaign and the car will be entered by him in various events during the season. Van Gorder has been driving cars since 1903, having driven the Thomas and Hotchkiss in hill-climbs and minor events. Two years ago he acted as mechanic for Harrison on the Weigel car in the grand prize race in France.



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Neglected Economics

IT is a recognized fact that a cluttered-up floor under a workman's feet will tire him quite as much as the productive work that he is doing. Fatigue of the workman in a factory, in a repair shop, or in a garage, is to be guarded against. Fatigue is generally due to three causes: First, unnecessary work, unnecessary motion, uncomfortable position, uncomfortable environments, and uncomfortable arrangements for working; second, fatigue is due to overwork; and third, fatigue due to improper rest before beginning work. No matter what the fatigue, it means a reduction of output; it means less accurate workmanship; it means reduced mental activities of the workmen, and consequently greater waste due to parts having to be discarded or junked.

FATIGUE in a factory has not been considered by many motor car manufacturers. With them it has been a negligible quantity. They have given the workman a machine, be it a drill, a lathe, a grinder, a cutter, a planer, or a multiple-spindle machine, and they have expected the workman to produce parts. In many cases the workman has failed. One leading manufacturer, who a year ago installed some of the most modern high-speed machinery obtainable, said he could not get workmen who could work the machines to anything like their capacity, and that he was unable to solve the situation. He said the workmen were intelligent, and some of them were the best that could be obtained and had made the highest reputation for themselves in other factories. It was suggested that he analyze the conditions. An analysis was started.

FIRST in the analysis came the layout of the factory, meaning the arrangement of the different machinery throughout, the amount of space given the workmen and the facilities placed at their disposal. It was immediately discovered that the arrangement of machinery was not symmetrical. Drills were placed side by side with planers, and planers with lathes, and lathes with grinders. It was immediately discovered that this mixing of operations brought about an unconscious confusion in the mind of the workman. The workman working at the lathe was master of his job, but his entire energies were not concentrated on it. One minute he was watching a grinder at his right, the next minute a drill at his left. The result was his efficiency was impaired. It was impaired because of distracting environments. Had this workman had a fellow workman to his right, operating the same kind of machine, he would have worked to higher efficiency because his distraction would have been less and there would not have been the same desire for him to watch his neighbor. Watching his neighbor may have been interesting to the workman but it was non-productive to the factory. The departmentized factory is today the most productive.

IN studying this analysis of the workman it was further noted that the trays from which he took the parts to be operated upon were not placed in the most convenient position and at the most convenient height. It was discovered that the workman had to stoop over every time he picked up a part to put on the machine, and had to lean over every time it was passed into the tray which was to take it back to the inspection department. There is nothing else that consumes energy faster than stooping over. An example from another industry will prove this. By experiment it has been found in the bricklaying trade that a workman lifting 90 pounds

of brick on a packet to the wall will be less fatigued, if he has not to stoop over in the operation, than if handling but 70 pounds of brick and having to stoop over in the operation. What is true in the bricklaying trade is true in every part of the motor car factory. The factory superintendent should see to it that the trays or racks holding the materials for the workmen are at the proper height, so that the necessity of stooping is eliminated. Where you eliminate stooping you increase the manufacturing speed and you insure greater accuracy of parts. Not only should the trays holding raw or manufactured parts be at the proper height but they should be in the proper relationship to the worker. It has been found by experiment that where materials are placed in the correct position, and at the proper height with reference to the workman and with reference to the machine that the productiveness of that workman has been more than doubled. Whenever the trays and racks are in the proper place the number of movements that the workman must make with his arms, his body and his legs have been reduced. Every time you cut out a movement you reduce fatigue, but you go further and increase the productiveness.

BUT the factory superintendent can go still further in the matter of neglected economics. He will discover that sunlight is one of the greatest economics in the factory. It is a great economic because it increases productiveness. It is further a great economic because it insures greater accuracy in manufacture. One of the biggest motor car builders in America, by actual experiment, discovered that when the electric lights were turned on in the factory in the short winter afternoons, that the electrical recording instruments on the switchboard did not indicate the slightest increase in electric current. Before the lights were turned on all the electricity was being consumed in driving the machinery of the factory. After the lights were turned on, there should have been a greater consumption of electricity, but there was not. The consumption remained the same. In some instances it was actually reduced. The explanation is that the workmen immediately started working at a lower rate of speed under the artificial light. The machines were operating at lower pressure, and the productiveness of the factory was immediately reduced. If this is the case, and this has proven that it is, when electric lights are used, there is no reason to believe but that the same thing holds true in a poorly lighted factory in the middle of the day.

BUT there are other neglected economics in a factory. One of these is ventilation. The human body resembles a gasoline engine. It must have oxygen the same as the engine must have its gasoline mixture. If you cut down the supply of oxygen the result is a lean mixture, and missing, the same as in an engine. Missing means loss in productiveness, and a loss in accuracy. You must give the workman pure oxygen with its proper percentage of nitrogen, otherwise the fire of life within him will be reduced, and his activities lessened. You can't give the pure oxygen and nitrogen without systems of ventilation. It is not enough to put up large windows and clear floors. You must have methods of circulating the air. If natural methods cannot be at hand, then artificial means of circulating must be employed and every precaution taken to insure pure air. Only when this is done will the correct man power be obtained, the same as with the motor, only when you give the proper mixture do you obtain the maximum horsepower.

American Exports Continue To Grow

WASHINGTON, D. C., March 26—More than a million dollars' worth of motor cars was shipped abroad during February, according to the latest returns of the government's statistical bureau. The number of cars exported was 1,023, valued at \$1,064,870, as, together with parts, not including tires, to the value of \$214,218. During the corresponding month of 1910 the number of machines exported was 561, valued at \$770,322, while the value of the parts exported was \$113,001. During the 8 months ending February the exports of motor cars increased from 3,529, valued at \$4,566,274, in 1910, to 5,840, valued at \$6,910,092, in 1911. The exports of parts likewise increased from \$808,610 to \$1,277,342 during these periods.

Exports in Detail

The shipments of cars and parts during comparative periods were in detail as follows:

FEBRUARY		
Exported to—	1910	1911
United Kingdom	\$150,457	\$150,142
France	31,145	28,242
Germany	8,954	12,738
Italy	81,093	19,764
Other Europe	15,489	40,890
Canada	357,797	670,090
Mexico	74,668	34,772
West Indies and Bermuda ..	66,476	40,793
South America	34,379	107,880
British Oceania	22,882	101,728
Other Asia and Oceania ..	23,256	53,013
Other countries	16,727	19,027
EIGHT MONTHS ENDING FEBRUARY		
Exported to—	1910	1911
United Kingdom	\$1,210,921	\$1,327,767
France	349,415	274,788
Germany	113,469	171,205
Italy	106,854	101,691
Other Europe	148,042	388,697
Canada	1,985,601	3,106,045
Mexico	366,681	484,480
West Indies and Ber-		
muda	315,408	281,977
South America	205,358	519,847
British Oceania	282,508	821,786
Other Asia and Oceania ..	192,232	528,649
Other countries	98,395	180,502

Imports Falling Off

Imports of motor cars continue to drop, the number received in February being only forty-two, valued at \$104,924, as against fifty-one, valued at \$108,855, imported in February a year ago. The imports of parts likewise declined in value from \$61,960 in February, 1910, to \$16,716 in February last. During the 8 months' period the imports of cars fell from 1,052, valued at \$2,040,597, in 1910, to 587, valued at \$1,250,144, in 1911.

The imports of cars during February last were as follows: United Kingdom, ten, valued at \$30,158; France, twenty-one, valued at \$46,813; Germany, one, valued at \$2,856; Italy, two, valued at \$4,050; other countries, eight, valued at \$21,047.

ELGIN FARMERS GIVE CONSENT

Chicago, March 27—All doubts as to the farmers agreeing to permit the national stock chassis road races of the Chicago Motor Club to be run over the Kane county course have been removed by the action of the property owners, who have agreed to terms with the Elgin Automobile Road

More Than \$1,000,000 Worth of Motor Cars Shipped in February—Imports Continue To Decline—Other Statistics



April 4-8—Commercial Car Automobile Dealers' Association show of Pittsburg, Pa.
April 8-9—Twenty-four-hour race, Los Angeles motordrome.

April 15—Motor Truck Club's commercial vehicle parade. New York City.

April 12-15—Show at Sioux Falls, S. D.

April 16-23—Show in Prague, Austria.

April 22—Redlands annual hill-climb. Redlands, Cal.

April 23-28—Touring car contests in Modena, Italy.

April 29—Quaker City fourth annual social run, Quaker City Motor Club.

May 7—Targa Florio road race, Italy.

May 14—Cataluna cup road race, Spain.

May 16-19—Four-leaf clover endurance run of Automobile Club of Washington, D. C.

May 19-25—Glidden tour from Washington, D. C., to Ottawa, Canada.

May 21—Hill-climb, Limonest, France.

May 21—Ries hill-climb, Austria.

May 25 or 28—Meuse hill-climb, Belgium.

May 25—Touring car kilometer speed trials, Le Mans, France.

May 25—Fuel economy test, Chicago Motor Club.

May 27-31—Five-day tour to Indianapolis of Chicago Automobile Club.

May 28—Hill-climb, touring cars, Le Mans, France.

May 28—Touring car reliability trials in Germany.

May 29-31—Tour to Indianapolis of Chicago Motor Club.

May 30—Five-hundred-mile international sweepstakes race, Indianapolis motor speedway.

June 1—Speed trials, Bucarest, Roumania.

June 4—Hill-climb, Trieste, Australia.

June 18—Voiturette and light-car road races, France.

June 22—Algonquin hill-climb, Chicago Motor Club.

June 25—Grand prix of Automobile Club of France.

June 25-July 2—Endurance contest, Denmark.

July 4-20—Prince Henry tour.

July 9—Mount Cenis hill-climb, Italy.

July 13-20—Ostend week, Belgium.

July 19-29—Motor truck run, New York to Chicago, Chicago Motor Club.

July 21-24—Meeting at Boulogne-sur-Mer, France.

August 6—Mount Ventoux hill-climb, France.

August 25-26—National stock chassis road races, Chicago Motor Club. Elgin, Ill.

September 2-11—Agricultural motor vehicle show, Roubaix, France.

September 9—Grand prix of Italy, at Boulogne, Italy.

September 10-20—Voiturette and small-car trials in Hungary.

September 16—Touring car competition, St. Petersburg-Sebastopol, Russia.

September 17—Semmering hill-climb, Austria.

September 17—Start of trials of l'Auto, France.

October 1—Gallion hill-climb, France.

October 9-13—One-thousand-mile reliability run, Chicago Motor Club.

Race Association. There was considerable haggling over the remuneration the property owners was to receive and this delayed matters for several days. When the Chicago Motor Club and the Elgin Automobile Road Race Association issued an edict to the effect that unless the farmers came to terms by tonight that the races would be taken somewhere else, the farmers got busy, organized and appointed a committee of five to complete the negotiations. This committee asked that instead of every property owner being guaranteed \$25 that this guarantee be graded according to frontage so that the small owners will receive \$10, some \$25 and those owning 40 rods or more frontage on the course to get \$75. This was agreeable to the Elgin promoters and now the work of securing the signatures of the farmers is going on. The farmers' committee has undertaken the work and it is expected that some time this week a contract between the Chicago Motor Club and the Elgin Automobile Road Race Association will be signed, thus insuring the renewal of the stock chassis events next August.

SHOW AT WATERTOWN, N. Y.

Syracuse, N. Y., March 25—Encouraged by the success of the show held here last week under the auspices of the Automobile Club of Syracuse, the Watertown Automobile Association held one this week; and the live organization of the little city 70 miles north of here scored a most satisfactory success, both in point of sales made and business done.

The show opened on Wednesday and ran 4 days, being held at the state armory. Every inch of space was taken for the exhibit, while in many of the garages about the city individual exhibits were made of cars which could not be accommodated in the armory. The armory exhibit represented a value of \$75,000. The Babcock company, formerly making carriages exclusively, now is manufacturing motor cars, so there was a Watertown-made exhibit of six cars.

IDEAL REORGANIZATION

Chicago, March 27—There has been a reorganization of the local company making the Ideal electric. The name has been changed from the Ideal Electric Co. to the Ideal Electric Vehicle Co. The capital has been increased from \$50,000 to \$250,000 and the election of officers resulted as follows: President, Bruce Borland; first vice-president, U. B. Grannis; second vice-president, Chauncey B. Borland; secretary, M. S. Willing; treasurer, Cyrus H. Adams, Jr.; directors, Henry A. Blair, E. W. Ryerson and C. D. Chase. J. D. Wiggins, for 2 years superintendent of the Woods plant, is general superintendent. The Ideal factory is located at 318 Huron street.

Blaze New Trails in the Far South

Savannah Motorists Lay Out Path to Pinehurst, Forming Missing Link in the New York-Jacksonville Route—Long Stretch from Columbia to Camden Is Pathfinded by a Cartcar



SAVANNAH PATHFINDERS ENTERING CAMDEN, S. C.

SAVANNAH, GA., March 20—After mapping out a route of over 390 miles for the coming endurance run of the Savannah Automobile Club to Pinehurst, N. C., next month and to make the missing link in the route from New York to Jacksonville, the Cartcar driven by D. B. Hull returned to the city this morning. The stretch between Savannah and Pinehurst never has been made officially and for this reason the route never has been given to tourists. After the endurance run, which probably will be either the first part of next month or in May, the Savannah Automobile Club will ask some paper in New York to promote a run from New York to Jacksonville, Fla., just as the New York Herald and Atlanta Journal have done to make the national highway from New York to Jacksonville through Atlanta and Savannah.

The Capital city route, as it now is called, is something like 300 miles shorter to Jacksonville than the national highway by the way of Atlanta and then again the roads are in a better condition than those on the national route.

The name probably will be changed from the Capital city to either the great north and south highway or the great southern highway. This is the idea of the Savannah Automobile Club.

The route is a good one and for several seasons tourists have been using it as far as Pinehurst, N. C. As laid out from New York the route takes in the following places: New York to Jersey City, to Philadelphia, Wilmington, Baltimore, Washington, Alexandria, Mount Vernon, Fredericksburg, Richmond, Petersburg,

Emporia, Raleigh, Fayetteville, Southern Pines and then to Pinehurst. This route has been made official and from Pinehurst the following places will be on the route after the run: Pinehurst, Darlington, Camden, Aiken, Augusta, Statesboro and Savannah.

The trip of the Savannah scout car was made in 3 days. The first day's running was from Savannah to Columbia in 9 hours, a distance of 210 miles. The trip was made over the route laid out by the Savannah Automobile Club as far as Augusta. The roads after passing Augusta are in fair condition.

After leaving Augusta Aiken, S. C., is next. To get there a long bridge over the Savannah river has to be crossed.

From Aiken no stops or towns are made, but the roads are in good condition to Columbia, the next stop. The roads between these places are at least 30 feet wide in most places and as much as 30 and 40 miles an hour can easily be made. Following is the mileage from Augusta to Pinehurst: Augusta to Aiken, S. C., 17.2 miles; to Columbia, 76.4 miles; to Camden, 119.1 miles; to Darlington, 171.3 miles; to Cheraw, 200.6 miles; to Pinehurst, 258.6 miles. From Savannah to Augusta the official route is 134 miles, making the total from Savannah to Pinehurst 392.6 miles. The first day's run will be from Savannah to Augusta, the second day from Augusta to Columbia and the third day from Columbia to Pinehurst.

After the scout car had traveled back as far as Columbia it was decided to lay out another route that would take in a part of the national highway. The car left Columbia for Charlotte, N. C., by the way of Camden, Kershaw, Lancaster and then to Charlotte. At Camden the road forks off from the capital route and goes to the national highway. Between Columbia and Charlotte the roads are much better than between Columbia and Pinehurst. It is not known just what route will be accepted by the Savannah Automobile Club, but it is thought that the capital run to Pinehurst will be chosen. The distance from Columbus to Charlotte is 130 miles, making the distance from Savannah 340 miles.

QUINCY HOLDS ITS SHOW

Quincy, Ill., March 27—The first annual Mississippi valley show, given in the large stone pavilion in Highland park, this city, closed last night with much noise and record for attendance, the variety of cars and number on exhibition, as well as the direct results to dealers. Another good accomplished was by Dr. Alfred Gunther and other representatives of the Chicago Motor Club, who interested the many visitors in a substantial way in road improvement work.



SAVANNAH PATHFINDERS ON BAD STRETCH NEAR AIKEN, S. C.

There were more than sixty cars in the exhibit, which included forty different makes, the combined value of which approximated a quarter of a million dollars. The color scheme was green and white and was carried out in the decorations, lighting and even the signs and announcement cards. Manufacturers' representatives and visiting newspaper people present were unanimous in their expressions of surprise at the extent of the exhibits.

Wednesday was Quincy day, Thursday Hannibal day, Friday Camp Point day, and Saturday farmers' day. In addition there was a parade on Friday afternoon which was promoted by the Quincy Automobile Club and the show promoters.

GIGANTIC ROAD PROJECT

Albany, N. Y., March 27—It is expected that a bill appropriating \$1,600,000 as New York's share in a proposition to construct a highway from New York city to Montreal will come up for passage in the assembly this week. The bill already has passed the senate and has the approval of Governor Dix. Not only is the governor himself interested in the proposition, but President Taft, Colonel Theodore Roosevelt, Mayor Gaynor of New York and Mayor Guerin of Montreal have indorsed the project. The New York end of the enterprise will consist of building the road from Manhattan to Rouse's Point, which will give a highway which will run from Montreal on the north to Jacksonville, Fla., on the south. The New York-Jacksonville leg is practically finished now.

ADD TO SPEEDWAY PURSE

Indianapolis, Ind., March 28—A big addition to the purse offered for the 500-mile race on the speedway on May 30 was made today when Wheeler & Schebler announced they will give a cash prize of \$2,500 to the winning driver, provided his car is equipped with a Schebler carbureter.



SAVANNAH PATHFINDERS ON A SOUTH CAROLINA ROAD

Booming New York-Montreal Highway

Canadians Interested in Movement, But Find It Hard To Select Suitable Route Through the Dominion—Some Favor Laprairie-Lacolle Way and Others Want To Take in City of St. John's



SAVANNAH PATHFINDERS NEAR PINEHURST, S. C.

MONTREAL, March 25—The construction of the proposed international highway between Montreal and New York now seems assured and the only difficulty would appear to be the selection of the route which the Canadian end of the road will follow. While the Laprairie-Lacolle route seems to be the most favored, there is a strong body of opinion in support of the route through St. John's. Deputations from supporters of both routes already have waited upon Sir Lomer Gouin, provincial premier, who is investigating their respective claims.

G. A. Simard, who was appointed chairman of the Canadian committee formed to further the project at a meeting of mayors

of interested municipalities held in Montreal a few weeks ago, has been very active going about the country explaining the scheme to the farmers, who are taking it up most enthusiastically. An example of the interest taken in the scheme was given at Lacolle, Que., when \$750 was subscribed at a meeting without waiting for the local municipality to take action. The Lacolle farmers say they will effect a saving of \$30 to \$40 per day by the construction of the highway. At present they pay that sum for conveying their milk to Montreal, but when the new road is made they will be able to send the milk by motor truck and have it in Montreal in much shorter time and in better condition, as the jolting it gets on the present roads does not tend to improve it. All the municipalities on the route favor the scheme and not only urge the necessity for the road but express their willingness to pay their full proportionate share.

Hitherto one of the greatest obstacles to the development and progress of the province of Quebec to the advancement of its farming population and the retention of the boys on the farm has been its execrable country roads.

CONGRESSMAN ON A TOUR

Champaign, Ill., March 24—Driving overland to Washington is the aim of Congressman William B. McKinley, of Champaign, Ill., who started east last Friday in a new Peerless six. Congressman McKinley expects to make the eastern trip in easy stages and plans to arrive in Washington in time for the extra session of congress called for April 4.



GENERAL VIEW OF THE MONTREAL SHOW, WHICH ATTRACTS MANY CANADIANS

MONTREAL, March 22—It needs such an exhibition as that which is in progress in Drill hall this week to bring home to the majority of us a conception of the extent to which the business of manufacturing motor cars has and is developing. On the city streets or on the country roads the generic term motor car is sufficient to cover all kinds and descriptions of motor-driven vehicles, but it is very different when the immense floor space of the largest hall in Canada is crowded to its uttermost inch with variants from the general type grading from the 90-horsepower monster down to the small runabout.

The show, as in former years, is under the direct auspices of the Automobile and Aero Club of Canada. The present show is fully 50 per cent bigger than last year's exhibition and in the opinion of some of the officials 100 per cent better. It is interesting to note comparisons with the number of motor cars at the show compared with what was exhibited at the cycle show held in Montreal in 1897, when there were four exhibitors of motor cars and nine machines shown. At the present show there are 142 cars aggregating many million dollars.

A feature that especially interests military men is the exhibition of specially constructed motor trucks for military service, including a scouting car, a gun truck, a transportation vehicle upon which the camp equipment of a whole regiment could be loaded.

The number of cars at present owned in Montreal is around 600, while the total number in the province of Quebec is near

Canadians Inspect the New Models

Show at Montreal 50 per cent Larger Than the One of Last Year—American and European-Made Cars Predominate—Interesting Feature Is the Display of Military Motor Vehicles

3,000. Most of the cars naturally are of American make, but with the numerous new Canadian factories springing up here and there and those which have been manufacturing for some time, their growth is of the right kind, as getting prompt delivery of parts is a big and predominant feature in the purchase of a motor car and this is where the Canadian manufacturers score. The importation of British and foreign cars is fast diminishing.

Distributing the Cars

Most of the dealers in Montreal represent cars for the province of Quebec and in some instances control the distribution for Canada, appointing agents throughout the dominion from this end. The city of Quebec has a number of dealers handling cars locally and motoring has grown to the point where they have formed a motor club, starting with a membership of fifty. Industrial conditions locally are in a most healthy and prosperous state and as Montreal is the wealthiest city in America for its size it bespeaks well for the sale of motor cars for the season of 1911.

The selling season in Montreal dates from February, but this year has been a trifle late on account of the severe winter and continued cold weather. Of course there are many who scorn the use of the motor car as a vehicle for winter traffic.

The touring season opens here in May.

In interviewing the trade as to conditions this year as compared with last it seems to be the general opinion of the trade that while the season has opened up a little late that the demand will be away in excess of last year. The show to date has been productive of some heavy selling and this is especially true in the demand for the intermediate priced cars.

One of the problems the dealers are up against is the question of trading in second-hand cars as a part payment on new purchases, but they are gradually overcoming this and are endeavoring as far as possible to insist upon the buyers selling their old cars themselves, which in reality is much better for all concerned.

Makes of Cars Shown

Among the makes of cars on view are the following: Speedwell, Marmon, Hupmobile, Regal, Dominion, Glide, Westcott, Cole, E-M-F, Flanders, Oldsmobile, Peerless, Maxwell, Reo, Velie, Lozier, Ford, Gramm truck, Russell, Chalmers, Packard, McLaughlin-Buick, Pierce-Arrow, Stearns, Inter-State, Mack truck, Gregoire, Berliet, Pope-Hartford, Franklin, Thomas, Hudson, Knox, Brush, Locomobile, Overland, Mitchell, Alco, Everitt, Metz, Abbott-Detroit, Baker electric, Cadillac, Kelly truck, Canada, Diatto.



FIRST OF PITTSBURG'S TWO SHOWS—THE ONE HELD IN EXPOSITION BUILDING

Another Show Now on in Pittsburgh

Affair in Exposition Building Is Followed by Duquesne Garden Exhibition Which Is Promoted by the Dealers—Many Come From Out of Town To See the Big Display

PITTSBURG, PA., March 27—The fifth annual show of the Automobile Dealers' Association of Pittsburgh opened at Duquesne garden Saturday night. In attendance, number of exhibits and beauty of displays, the show far excels any other show put on by the association in this city.

More than \$500,000 worth of domestic and foreign cars are on exhibition. The settings are dazzling in their completeness and the arrangement of the floor plan is such as to give their exhibitions the best benefit of light and all points of view, etc. A profusion of flowers ornament the entire garden and add greatly to its beauty.

Many from Out of Town

The most striking feature of the first two evenings of the show was the large proportion of out-of-town visitors numbering dozens of the leading dealers in western Pennsylvania, eastern Ohio and West Virginia. Advices received from these towns indicate that many of them are going to send a full delegation of dealers and salesmen later in the week, when there should be good business.

Local dealers report several interesting features, one that the 1911 demand so far as Greater Pittsburgh is concerned is distinctively for medium-priced cars. This

explains why the second-hand dealers have been doing such an enormous business this year. The out-of-town buyers especially are calling for cars costing from \$1,500 up and their interest in this exhibition proved them to be probable purchasers in the near future. The heavy touring cars here also is in good demand with well-to-do buyers and these cars have come to stay in Pittsburgh, because of their success in taking the heavy grades and bad roads that have made this section a stumbling block to many car manufacturers. The electric vehicles called forth a large amount of favorable comment and it is safe to say that they are seen more on Pittsburgh streets now than in any previous year. Manufacturers have overcome the difficulties that formerly made them almost useless in this part of the state.

The commercial truck exhibit is being held in reserve for next week, when there will be shown the finest lot of commercial trucks ever put on view in Pittsburgh. A few well-known trucks are on exhibition this week and the interest taken in these by manufacturers proves that next week's commercial vehicle show is going to be a big one.

The different makes of cars on view are as follows: S. G. V., Jackson, Atlas, Baker electric, Buick, Pope-Hartford, Marion,

Waverley electric, Paterson, Franklin, Peerless, Hupp-Yeats, R. & L. electric, Stoddard-Dayton, Marmon, Krit, Staver, Chicago, Michigan, Mercer, Pullman, Cadillac, Pierce-Arrow, Wescott, Owen, Lozier, Locomobile, Hudson, Empire, Inter-State, Chalmers, Simplex, Packard, Stearns, Maxwell, Columbus electric, Stevens-Duryea, Elmore, Winton, White steamer, White gasoline, Premier, Reo, Hupmobile, Corbin, Ohio, Clark and Abbott-Detroit.

End of Exposition Show

A big tri-state show was practically assured for 1912 at the informal meeting of the Pittsburgh Automobile Show Association held on Saturday night at the close of its first exhibit, which had been on all the week in the Exposition building. Carnival night—the last night—witnessed the largest throng of any night since the show had opened and the doors were not closed until nearly midnight. The enthusiasm was contagious and the show committee, which will be tendered a big banquet at the Fort Pitt this week, was congratulated on all sides for the fact that 68,400 people had passed into the big Exposition hall during the week. Both Manager Thomas I. Cochran and his associates on the show committee were positive from the success of this year's show that a tri-state exhibit can be billed for next spring. It will be held in the Exposition hall, including not only the Music hall, but also the immense main hall and machinery hall. Preliminary arrangements will be announced shortly and work will be started some time this spring. Pittsburgh's success with its two shows this spring has made everyone decidedly optimistic.

Cadillac Buys a Body-Making Plant

**Purchase of the Monroe Company's Factory Consummated—
New Incorporations of Car and Parts Making Concerns Are
Reported from Detroit—Demand for Experienced Workmen**

DETROIT, Mich., March 27—As a result of a deal closed the past week, whereby the Cadillac Motor Car Co. acquires the Detroit plant of the Monroe Body Co., of Detroit and Pontiac, the former company is now manufacturing practically every part of its car. The body plant is located at Fort and Twenty-fourth streets and employs 450 men. It will continue running full time, turning out seventy-five bodies per day. R. F. Monroe, of Pontiac, will continue to act as manager for another year at least. The new arrangement enables the Cadillac company to control the production of its cars from the purchase of the raw materials to the finishing of the body. The terms of the purchase were not made known.

Several new corporations, organized for the manufacture of motor cars or parts, have come to light during the past few days. The Wayne Motor Co. has filed articles of incorporation with the secretary of state. The capital stock is \$30,000 and the incorporators are Alpheus Collins, Detroit; George W. Woods, Walter H. Woods and Andrew Hunter, all of Ann Arbor.

The Michigan Steering Wheel Co. has been organized with a capital of \$7,000, and will manufacture solid-bent steering wheels at 274-278 Wight street, employing thirty-five men. The principal stockholders, all Detroit men, are: Titus L. Denk, Ward B. Arbury, Hugo I. Denk, Eugene A. Bresler and John Elliott.

The Commerce Motor Co., of Detroit, has established a Canadian connection with the Watson Carriage Co., Ltd., of Ottawa. The latter concern will build and market the Commerce delivery car in the Dominion.

A large eastern manufacturer of machine tools is now negotiating for a site in this city with a view to removing his plant here not later than June 1. There are now no machine tool factories in Detroit, although \$3,000,000 worth of these products is sold here annually.

Things are booming in the majority of the local car plants. The E-M-F plant No. 3, where the Flanders 20 is made, took on 100 additional machinists this morning and is increasing its activities all along the line. The Buick Motor Co., of Flint, wants a large number of experienced painters at once. The Chalmers Motor Co. is putting on additional transmission assemblers, inspectors, drill press hands and truckmen. Dodge Brothers are advertising for lathe, bench and drill press hands for both day and night work in their new plant in the northeast end of the town. The McCord Mfg. Co. needs radiator repair men and testers, and bodymakers are wanted by the C. R. Wilson Body Co.

The Ford Motor Co. has been unusually busy turning out model T cars for both the home and foreign trade. The company claims that its foreign shipments are averaging more than 100 cars per week.

Harry M. Jewett, president of the Paige-Detroit Motor Car Co., says that, although the company has increased its floor space 100,000 square feet and has more than doubled its working force, it is still unable to keep up with orders. The factory is now running three nights a week.

B. F. Everitt, president of the Metzger Motor Car Co., who returned Friday from the east, reports that he found trade conditions promising in that section. He predicts a shortage in raw material before the season is much farther advanced. The Metzger company is now shipping close to its limit of twenty-five cars per day, Mr. Everitt says.

INDUSTRY HURT BY WAR

Torreón, Mexico, March 25—The guayule crude rubber output of Mexico is being materially reduced by the interruption of railroad traffic and the generally disturbed conditions due to the operations of bands of rebels. All of the rubber factories are running short-handed, due to the scarcity of labor and the further fact that some of them are unable to obtain a sufficient supply of the guayule shrub to keep going.

The order that was recently issued by the National Railways of Mexico prohibiting its agents from furnishing cars for the movement of the guayule shrub or its product was in effect only a few days when the complaints of the International Rubber Co. and other American interests caused it to be rescinded. To all practical purposes it still is in effect, however, as the rubber manufacturing concerns are unable to procure cars for transporting the shrub to their respective factories or to move the crude rubber, the excuse that is given by the railroad being that a shortage of cars prevents a compliance with the transportation demands of shippers.

While it is known that the movement of troop trains is requiring the constant use of a large amount of railroad equipment, the guayule manufacturers claim that the injury that is being done the rubber industry has for its object the cutting off of the revenue-earning capacity of the Madero family, which next to the Intercontinental Rubber Co. is the largest manufacturer of rubber in Mexico, and that the government is back of the action of the railroad in the matter.

Another thing that is curtailing the crude rubber output of this region is the inability of the land owners to get labor-

ers to cut and gather the guayule shrub. Many of the large ranches are practically deserted on account of the revolutionary disturbances. The hacendados, as the land owners are called, have flocked into the larger towns in great numbers and are giving little if any attention to business matters pending the unsettled conditions.

A study of the invoices of this United States consular district shows that during the period from January 23 to February 14, 1911, there was shipped to the United States 1,567,500 pounds of crude rubber. The recent inauguration of three new guayule rubber factories in the Torreón district is expected to materially increase the output of the product as soon as the present disturbed conditions of the rural localities from which the supply of shrub is drawn subsides. One of these new factories is at Monclova, another at Port Carmen and the third at Gomez Palacio.

During the period of revolutionary troubles it is found difficult to retain laborers upon the ranches, and the decrease in the supply of shrub at some of the factories is due to this fact. It is stated here that the Intercontinental Rubber Co. contemplates erecting one or more additional factories of large capacity. The biggest sale of guayule shrub in the history of the industry took place here a few days ago when Evaristo Madero sold to the Intercontinental Rubber Co. 4,000 tons, the consideration being more than \$1,000,000.

BIG FIRE IN PHILADELPHIA

Philadelphia, March 24—Motor cars valued at thousands of dollars were either consumed entirely or hopelessly crippled in a fierce fire on motor row last evening, destroying the buildings at 253 to 259 North Broad street. The establishments temporarily put out of commission were the Stoddard-Dayton Automobile Co., 253-255 North Broad street, and the Longstreth Motor Car Co. and Auto Top and Body Co., occupying the adjoining buildings at 257 and 259. The Auto Top and Body Co. plant was entirely destroyed, and that of the Longstreth Motor Car Co., Philadelphia distributor of the Alco and Pullman, fared little better, the entire stock on hand, amounting to about fifteen cars, being wiped out, entailing a loss of \$40,000. So rapid was the spread of the flames that it was a physical impossibility to rescue any of the cars. The greatest loss was sustained by the Stoddard-Dayton company, twenty-five cars being ruined and the money loss being estimated at not less than \$85,000. By rapid action a few cars occupying the first floor of this building were hustled out in time.

It was only by dint of strenuous and heroic work that the whole block was saved from being swept by the flames, a high wind placing the many motor establishments in the vicinity in a precarious position. The cause of the blaze is not

definitely known.

Temporary quarters have been secured by the crippled firms, the Stoddard-Dayton at the northeast corner of Broad and Race streets, and the Longstreth company is using one of the offices of the Firestone Tire and Rubber Co., 256 North Broad street, pending the rebuilding of the burned structure.

BILL A BLOW AT INDUSTRY

Lansing, Mich., March 25—Manufacturers of motor cars in the state of Michigan are aroused over a bill which has passed the house and which if it passes the senate, will cause untold damage to the industry in this state. The bill prohibits the sale of any vehicle or tool in the manufacture of which, or of any part, taps and dies, other than that of the so-called United States standard, have been used. The bill has passed the house through the misrepresentations, it is said, that the United States standard was a compulsory one.

A majority of the representatives, believing that a United States law was being violated, voted for the measure, and the motor industry now is making a strenuous endeavor to prevent a similar misunderstanding from influencing the action of the senate.

To have a law passed making the United States standard the legal one in this state would mean that millions of dollars' worth of tools would have to be discarded and new ones bought. The United States standard, even if adopted, could not possibly be used, for the taps and dies which accord with it are too heavy for fine work. It would mean larger valves, larger nuts, connections, gears, pipes, forgings, etc., and the added weight would be so great that a pleasure motor car under the United States standard would resemble a motor truck more than the light and graceful machines now seen everywhere.

TRUCK RUN POSTPONED A YEAR

Chicago, March 24—The scheduled New York-Chicago motor truck run of the Chicago Motor Club, booked for the latter part of July, was postponed to 1912 by the contest committee at its weekly meeting yesterday. To give the power wagon a place on the local organization's calendar it was determined to ask that a series of national demonstration tests be held in this city by the Chicago Motor Club late in the fall. It was felt by the contest committee that it was about a year ahead of time in scheduling such a long run as the New York-Chicago test, that many of the manufacturers were not ready and that by waiting a year it would be possible to stage a reliability cross country run that would include all the representative concerns. Another reason for the postponement was that the club's technical committee, weakened by the absence of F. E. Edwards, will not be in position to devote an entire month to working on such a long test.

Car Makers Supporting the Sport

Twelve New Names Added to Roster of Manufacturers, Contest Association Within Last 2 Months, Bringing Total to Forty-eight—Power-Wagon People Becoming Interested

NEW YORK, March 25—Membership in the Manufacturers' Contest Association is increasing rapidly. Within the last 2 months twelve new makers have joined, making a total roster to date of forty-eight. Within the next month at least twenty more are expected to become affiliated with the association.

The move to interest the commercial car makers, which began at Chicago during the Chicago show, has proven a step in decidedly the right direction. The manufacturers of these utility motor vehicles appreciate the great benefit that well-managed contests will play in the future of their business. In Germany, France and England the records made in regularly organized commercial vehicle contests are a potent selling argument referred to by prospective customers, as a business matter. These records must be accurate, fair and not give a misleading impression.

The Manufacturers' Contest Association now has in hand preliminary data as a basis for its recommendations to the contest board of the American Automobile Association as to what should be the rules to govern commercial car contests. Howard Marmon, chairman of the general rules committee of the M. C. A., will appoint in the near future a special rules committee of five which will perform the same mission in regard to commercial car contest rules as the present active rules committee of five has to do with pleasure car regulations. Mr. Marmon will also recruit the general rules committee of twenty-five up to its limit.

The concerns which retain their membership in the association this year are: Apperson Brothers Automobile Co., American Motor Car Co., American Locomotive Co., Brush Runabout Co., Buick Motor Co., Benz Auto Import Co. of America, Chalmers Motor Co., Columbia Motor Car Co., Dayton Motor Car Co., E-M-F Co., Fiat Automobile Co., H. H. Franklin Mfg. Co., Hol-Tan Co., Hudson Motor Car Co., Knox Automobile Co., Locomobile Co. of America, Lozier Motor Co., Maxwell-Briscoe Motor Co., Mitchell-Lewis Motor Co., Moline Automobile Co., Metzger Motor Car Co., National Motor Vehicle Co., Nordyke & Marmon Co., Olds Motor Works, Oakland Motor Car Co., Peerless Motor Car Co., Premier Motor Mfg. Co., Pierce-Arrow Motor Car Co., Palmer & Singer Mfg. Co., Renault Freres Selling Branch, Reo Motor Car Co., F. B. Stearns Co., Selden Motor Vehicle Co., E. R. Thomas Motor Co., White Co., Willys-Overland Co.

The new members are as follows: Cole Motor Car Co., Cadillac Motor Car Co., Empire Motor Car Co., Motor Car Mfg. Co.,

Ohio Motor Car Co., Pope Mfg. Co., J. I. Case Threshing Machine Co., Grabowsky Power Wagon Co., Rapid Motor Vehicle Co., Saurer Motor Co., Mais Motor Truck Co., Daimler Import Co.

BAN ON BIG CARS REMOVED

New York, March 25—The contest board of the American Automobile Association has restored to good standing the Blitzen Benz, the Prince Henry Benz, the Vanderbilt Darraq and the six-cylinder Knox, formerly Barney Oldfield's racing outfit, now owned by E. A. Moross. The disqualification and suspension were raised upon the payment of a fine of \$1,000 and the guarantee of Moross that under no circumstances shall the cars revert to Oldfield during his term of disqualification. The contest board also has issued a list of disqualifications, which is as follows:

Name and Address	Disqualification expires
Louis Arms, Los Angeles, Cal.	Apr. 1, 1912
W. D. Arrison, Washington, D. C.	Indeterminate
Ascot Park track, Los Angeles, Cal.	Apr. 1, 1912
Aubrey Austin, Los Angeles, Cal.	Jan. 1, 1912
E. H. Bechtel, Los Angeles, Cal.	Apr. 1, 1912
Henry Buckley, Los Angeles, Cal.	Apr. 1, 1912
W. H. Carlson, Jr., Los Angeles, Cal.	Apr. 1, 1912
A. Gary Carter, Washington, D. C.	Indeterminate
Frank Chance, Chicago	Jan. 1, 1912
George H. Clark, Dallas	Apr. 1, 1912
W. B. Condit, Los Angeles, Cal.	Jan. 1, 1912
George Edwards, Norfolk, Va.	Jan. 1, 1912
W. H. Faust, Los Angeles, Cal.	Jan. 1, 1912
H. E. Frederickson, Omaha, Neb.	Jan. 1, 1912
Louis S. Halliwell, New York	Jan. 1, 1912
Leslie Henry, Los Angeles, Cal.	Jan. 1, 1912
International Fair Association track, San Antonio, Texas	May 26, 1911
Ben Kerscher, New York	July 1, 1912
J. R. Kittle, Los Angeles, Cal.	Jan. 1, 1912
Henry Koch, Los Angeles, Cal.	Jan. 1, 1912
Chester Lawrence, Los Angeles	Jan. 1, 1912
W. H. Lewis, Los Angeles, Cal.	Jan. 1, 1912
E. R. Maier, Los Angeles, Cal.	Jan. 1, 1912
L. R. Mellus, Los Angeles, Cal.	Apr. 1, 1912
Arthur Oakerman, Los Angeles	Jan. 1, 1912
Barney Oldfield, Los Angeles, Cal.	July 1, 1912
W. H. Pickens, Chicago	Indefinitely
Premier Motor Manufacturing Co., Indianapolis	Indefinitely
Richmond Jockey Club track, Richmond, Va.	Jan. 1, 1912
James B. Ryall, Los Angeles	Jan. 1, 1912
J. E. Sheldon, New York	Jan. 1, 1912
J. Alex Sloan, Chicago	Apr. 1, 1912
Bert Smith, Los Angeles	Jan. 1, 1912
H. O. Smith, Indianapolis	Indefinitely
C. F. Stamps, Jr., Los Angeles	Apr. 1, 1912
Roger E. Stearns, Los Angeles	Jan. 1, 1912
J. Watlington, Los Angeles	Jan. 1, 1912
E. W. Williams, Los Angeles	Jan. 1, 1912
James L. Winslow, San Antonio, Texas	Jan. 1, 1912

JAILED FOR STEALING CARS

Cleveland, O., March 27—A precedent was established in Cleveland last week which bids fair to put an end to car stealing, when six young men who stole a car from the F. B. Stearns Co. were convicted and sent to jail in addition to being fined. Five of the men received sentence of 10 days and \$10 and costs each, the other \$5 and costs. So far as can be ascertained, this is the first case in Ohio where anyone has been given a jail sentence for stealing a car.

EXCESS OIL IN ONE CYLINDER

S MYRNA, Mich.—Editor Motor Age—
S Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—How deep should the end of the connecting rod dip into the oil in a 1909 model 10 Buick. The ends of the bolts that hold the bearing on stick down $\frac{1}{4}$ -inch lower than the connecting rod.

2—I would also like a suggestion as to how to keep the front cylinder from getting too much oil.—Elmer Hart.

1—The ends of the connecting rods should not dip into the oil more than $\frac{1}{16}$ inch; that is, not more than $\frac{7}{16}$ inch from the bottom of the nuts to the top of the oil.

2—The excess oil in the front cylinder is probably due to a worn piston. The piston rings may have become worn or dead. New piston rings will probably correct the trouble and give you more compression.

BLACK FOR BRASS WORK

Kansas City, Mo.—Editor Motor Age—I have just received a new car, and am desirous of more information in regard to two things:

1—I do not desire to polish the brass on my machine, as I have not the time to fool with it, therefore I wish to cover this brass with some substances such as paint or nickel. I would very much rather paint the brass of the lamps and foot boards where the brass covers the edges, than to have it nicked. Can it be done satisfactorily, so that there will be no chipping off or cracking? Please give me the best method of making this paint. Some say shellac and lamp black is the best. Of course, Motor Age has these problems to face many times and the prescription is a more difficult one for me than it is for you.

2—Kindly tell me in regard to the filler of the tires. Now we have in this town what is called "a liquid gelatine filler" this is placed within a pneumatic tire inner tube, and is vulcanized. The agents claim for this that you can get as much pleasure in the car as with air, and are rid of puncturing, and guarantee it not to be affected by heat or cold. There is also on the market here, Brown's scientific patent inner tube. This I know nothing about more than you can stick a nail into it inflated on a table and it does not seem to affect the air pressure when the nail is removed. Also do not know whether the tire will hold up after a few months' service in the casing.—J. S. E.

1—A black varnish that is said to give very good results on lamps and other brass work is made from the following ingredients:

Shellac, 8 parts; rosin, 5 parts; lamp-black, 1 part; alcohol, 94 per cent, 32 parts. If a dead black finish is desired, use oil of turpentine as the solvent with the same proportion of the other ingredients.

The Readers'

Many lamps today are japanned, that is, are given a coat or several coats of japalac or some other dark paint. Then, again, one often sees lamps which are coated for the most part with black enamel which is applied by means of a baking process. Many lamps are also given a gun-metal or black enamel finish, which consists of changing the surface of the metal itself by an electroplating process. These processes give a much more durable finish than the paint made by the formula outlined above, but the black enamel or electroplated finish will require the services of an expert.

There are many concerns which manufacture slow drying enamels. These are applied by an ordinary paint brush and require over 12 hours to dry.

2—Motor Age is not sufficiently familiar with the tire fillers or the inner tube mentioned to offer an opinion on their wearing qualities. Perhaps some of the other readers could help you out.

MISSSES ON LOW SPEED

Yukon, Okla.—Editor Motor Age—I would like some advice on the adjustment of my 6-40 model L Thomas. I recently had the valves ground and some other minor repairs made, but have not been able to run slower than 10 or 12 miles per hour, when going on the level or when the car was running easily, without missing. The car pulls well and can take medium grades at 6 or 7 miles per hour with throttle advanced and retarded spark without missing, but running easily on the level it misses if the speed gets below 10 or 12 miles. I have tried to remedy the trouble by carbureter adjustment, but have been very unsuccessful.—G. B. Bass.

It is very possible that there is a leakage of air into the cylinders, spoiling the

EDITOR'S NOTE—To the Readers of the Clearing House Columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

quality of the charge when the engine is running at a low speed with the throttle partially closed. This may be due to wearing of the valve guides. Or the valve springs may be weak, so that the valve is sucked open when the throttle is partially closed, pulling exhaust back into the cylinder. A screwdriver forced into the spring to stretch it when the motor is running will quickly prove whether the trouble is due to this cause. An air leak in the inlet manifold may be the cause of the missing. The adjustment of the carbureter should be looked to first in a case like this.

You also should be sure that the push rods are not too tight, also that the valves are really properly ground, and also that there is no air leak in the intake manifold. This last may be tested with a common oil can of gasoline, with which gasoline is to be squirted on the manifold joints while the motor is running. If the leak is present, the motor will slow down.

MOTOR REFUSES TO STOP

Houston, Texas—Editor Motor Age—In trying to locate the cause of my speedometer light not working with the switch on the magneto, either the engine running or idle, I found the primary wire running from the battery through the coil to the timer loosely connected. On tightening this the light worked with the switch in any position. On starting up the engine I found the light all right with the switch on the magneto, but was unable to stop the motor. I took the switch completely off the dash and still the motor ran. Thinking that in some way it was getting a current from the battery I disconnected that and still the motor ran, and the engine did not stop until I choked it off at the carbureter. I put the switch back, connected the battery and started the engine, and have had no more trouble since. My car is a Chalmers 30, model K, fitted with double ignition and the light is connected to the storage battery. Will Motor Age kindly inform me how did the loose connection on the timer affect the light when the switch was on the magneto? How did the motor get the current with no connection on the switch?—D. Kaufman.

It does not seem from your description of the trouble that the speedometer lamp was affected by the ignition switch or the timer, but that when you were working on the timer connection a loose connection in the lighting circuit was cleared at the

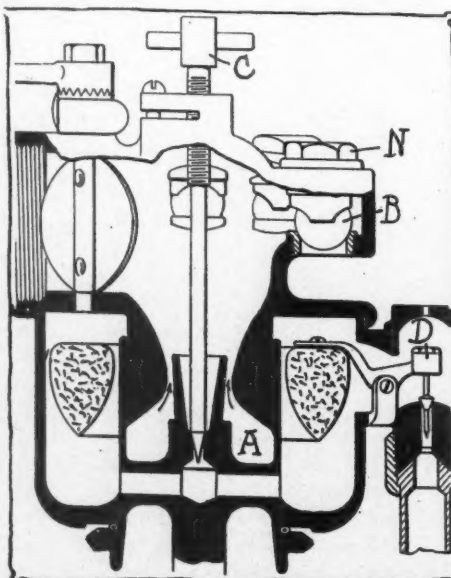


FIG. 1—KINGSTON CARBURETER

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

same time. The fact that the motor continued to run when the switch was removed from the dash was because the short-circuiting connection in the switch between the primary terminals of the magneto armature was opened. The switch is so arranged that throwing it to the off or battery positions short-circuits the primary coils of the magneto, allowing it to run without supplying current to the spark plugs. When this short circuit is broken with the engine running the magneto would continue to ignite the charge.

ECONOMY OF TWO-CYCLE ENGINE

Morocco, Ind.—Editor Motor Age—Kindly answer through the Readers' Clearing House the following questions:

1—Will a two-cycle engine run as economically as a four-cycle engine if each is controlled by a governor so as to run at its most economical speed? This question refers to fuel alone.

2—If, under first question conditions, the wear and tear on all the extra moving parts of a four-cycle engine and the labor of keeping both engines in proper condition are taken into account, which engine is more economical?

3—What weight would be required on two wheels, with 3-inch steel tires, to give them the tractive power to pull a four-horse, actual, load?

4—Do you know if any of the transmission engineers have ever worked out a sliding gear giving at least six speeds and an equal number reverse?—A Subscriber.

1—Practically, yes if they are both well designed motors.

2—The two-cycle is more economical under the above conditions.

3—This varies according to the grade and diameter of the wheels as well as road conditions, but may be taken at from 1,000 pounds on the level to 3,000 pounds on a 6 per cent grade.

4—No. We have no record of such.

GEARSET NEEDS ATTENTION

Nettleton, Ark.—Editor Motor Age—Kindly answer the following questions through the Readers' Clearing House columns:

1—Can Motor Age give me a desirable solution or prepared compound for washing scales and deposit out of a radiator?

2—I am using an Exide storage battery for lamps and find on top near the positive post a crack large enough to allow the electrolyte to spill out, short-circuit-

ing my six dry cells. How can I proceed to make the necessary repairs? Was this caused by freezing or constant jarring?

3—Does the grinding of the transmission on first and second speeds signify the need of an overhauling of same or is this grinding common to most cars after being in operation for a short time?

4—Is the use of the Skinner automatic tire pump, screwed into the spark plug hole, considered injurious to a motor?

5—Is it advisable to have a casing not too badly worn, retreaded?—F. S.

1—You are referred to a communication from Putnam, Okla., and signed F. C. Staley in the Readers' Clearing House, Motor Age for March 23, for an answer to this question.

2—The cover of your Exide battery is broken. Your best scheme is to communicate with the St. Louis office of the Electric Storage Battery Co., which handles the Exide. Unless you have every facility for making this repair you probably would not meet with much success.

3—The grinding of the gears in first and second speeds indicate that the bearings are worn or out of adjustment, or the gears themselves are badly worn.

4—The operation of the tire pump from the spark plug hole of the motor would not interfere with or injure the motor. There are pumps at present being operated very successfully this way.

5—You will get very good results out of retreading a casing that is not very badly worn. On the other hand, if you let it get too badly worn it would be folly to retread.

SIZE OF DYNAMO

Mayville, N. Dak.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—What size dynamo is needed to light 30 lights, and for only 1 light of 16 candlepower?

2—Would a two-cycle engine prove successful? If so, how large should it be to light thirty lamps?

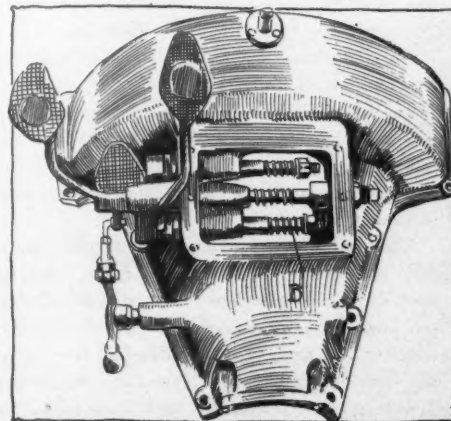


FIG. 2—ADJUSTMENT OF FORD BRAKE

3—What is the correct pronunciation of Lozier?—A reader.

1—The size of generator required will depend upon the kind of lamps used. For instance: Tungsten lamps will take about one-third as much current as carbon lamps of the same voltage and candlepower. Thirty 16-candlepower carbon lamps will require a generator of 1.8 kilowatts capacity, whereas the same number of 16-candlepower tungsten lamps will need a generator delivering .6 kilowatts. One carbon lamp takes .06 kilowatts, while one tungsten lamp takes .02 kilowatts, or 20 watts.

2—A two-cycle engine of good design should prove satisfactory, but the best plan is to get one of the generating sets which are sold for this service. In these, generator and engine are designed to work together for small lighting installations and usually prove more reliable and economical than those not built as a complete outfit. If 16-candlepower carbon lamps are used the engine should deliver about 3 horsepower and a 1-horsepower engine will supply enough power for the tungsten lamps.

3—The name Lozier is pronounced like the word Hoozier, except that the o is long, as in gō.

EFFICIENCY OF SHAFT DRIVE

Dixie, Wash.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—What per cent of the power of the motor is delivered to the rear wheels on a car that has only one universal joint and a straight line drive? For example: The Rambler or any other car with a similar drive.

2—What per cent does the drive with three universal joints and not a straight line deliver to the wheels? Of course, I understand that certain springs need a different driving system.

3—Kindly explain how the differential works on the Franklin or Rambler which is not of the bevel gear type.—Paul Thonney, Jr.

1—The average efficiency for shaft-driven cars is about 80 per cent, although it may vary as much as 5 per cent either way. This does not take into consideration the number of universal joints in the system or whether a straight-line drive is used.

2—The efficiency would not be affected by more than 1 or 2 per cent by an additional universal joint. Exact figures on the efficiency of the transmission of power from the engine to the driving wheels by any particular system can only be obtained by tests of the system in question, as the efficiency of the bearings, for instance, often has as much effect as the number of universal joints.

3—The type of differential used on the Rambler or Franklin is known as the spur-gear type. It is composed of a spur or internal gear keyed to each half of the

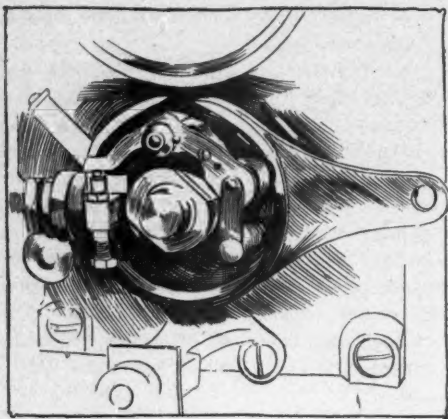


FIG. 3—SPLITDORF CONTACT BREAKER

live rear axle, a case or housing to which is fastened the drive and several pairs of pinions journaled in the case. Each pair of pinions meshes with each other and their ends extend one each way to engage with the internal or spur gears keyed on the ends of the axle. The action is as follows: The axle on one side revolves, carrying with it in rotation its large internal or spur gear, which in turn revolves the pinion which is in mesh with it. This pinion's companion or mate of the pair in turn is revolved, these being journaled in the case, and the mate pinion being in turn meshed with the other gear keyed on the other half of the shaft now must turn that gear or, if as we will suppose the case in which this gear is stationary, then the last pinion must revolve around this gear on the axle, carrying the case around with it. Thus the power being applied to the case allows the movement of one wheel with the other stationary.

TIMING MAGNETOS

Lincoln, Neb.—Editor Motor Age—Through the Readers' Clearing House kindly answer the following questions:

1—Kindly publish a diagram of the breaker boxes and give instructions for adjusting the Eisemann, Bosch, Remy and Splitdorf magnetos.

2—Make a diagram of a motor with a 5-inch stroke and show the relative positions of the piston, when a spark occurs, with spark retarded and advanced, and position

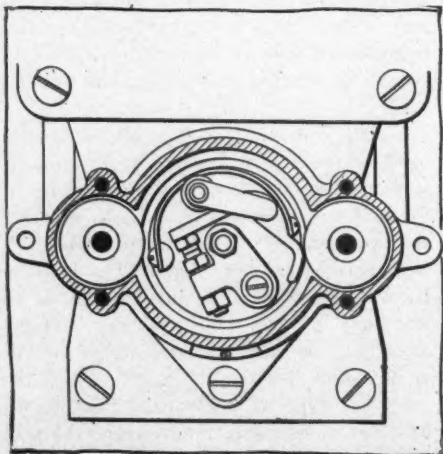


FIG. 4—BOSCH CONTACT BREAKER

of the armature and interrupter at these times. I do not suppose they are all alike, but show general view.—Magneto.

Remy Magneto

1—To correctly set the Remy, set any cylinder at top firing center, set the circuit-breaker housing vertical, move the distributor so that the line on the distributor blade coincides with the high-tension lead wire in the distributor case—any one of them—then lock the pinion gear to the motor in this position. With the circuit-breaker housing still vertical, move the circuit-breaker screw until the points barely separate. Connect up the spark plug wire from the cylinder the magneto was set to, to the lead distributor was set to, and the rest of the plug wires following the order of cylinder firing in the direction of the rotation of the distributor.

When a Remy magneto is received from the factory there is a particular relation obtained between the distributor movement and armature position, so that when the spark is advanced fully the break at the interrupter or spark is obtained at the armature position of greatest current intensity. In setting the magneto, therefore, it is desired to correctly set the distributor, and this in itself sets the armature also by the factory setting between the distributor and armature. The contact point then should be set last.

Correctly timing the magneto is done by the distributor, the spark by the circuit-breaker, hence the caution "Do not set the magneto by the breaker." Any attempt to do so would in nine cases out of ten cause the magneto to work through a very small portion of spark advance permissible with a magneto, due to the breaker breaking outside of the armature field.

Splitdorf Magneto

Crank the motor until cylinder No. 1 is exactly on its firing center—that is, the point of greatest compression. The motor must remain in this position until the balance of the work is finished. Retard the spark advance mechanism at the steering wheel to its limit and connect it to the spark advance lever on the breaker box of the magneto, so that if the magneto shaft revolves in a clock-wise direction looking at the driving end, the breaker-box lever will be at its topmost position. If the shaft revolves left-handed the lever should be at the bottom limit, and advanced upward. Now revolve the armature shaft in its direction of rotation until the oval breaker cam comes in contact with the roller in the breaker-bar and just begins to separate the platinum contacts. The flange of the coupling can then be drilled and reamed for a taper pin and the timing of the magneto is then permanently effected.

Then connect the terminals on the magneto to those on the transformer, making sure of the connections. After ascertaining the position of the bronze sector of the distributor, connect the cup directly over it to the spark plug in No. 1 cylinder. Since the direction of rotation of the distributor is always opposite to that of the armature



FIG. 5—REMY CONTACT BREAKER

shaft, the wire from the cup next in rotation goes to the next cylinder in sequence of firing and so on until all four are connected. Four-cylinder four-cycle motors always fire either 1-2-4-3 or 1-3-4-2, the latter being the most general rule. If the breaker cam is put on with the side marked R out, the armature is to revolve right-handed or clockwise looking at the driven end; if the L mark is out, it is to run counter or left-handed.

Bosch Magneto

Having fixed the magneto to the motor, the driving pinion is loose on the cone of the magneto spindle. First remove the connecting bridge and the dust cover in order to control the position of the armature. Now turn the motor by hand until one of the pistons is at the end of the compression stroke exactly on the dead center. Then bring the armature of the magneto into position, as shown in Fig. 8, clockwise or anti-clockwise, as the case may be, when viewed from the driving end of the magneto. Having placed everything in position as above described, tighten the pinion on the spindle of the magneto. The greatest care must be taken not to alter the position of the armature while this is being done.

The connection to the spark plugs on the cylinders must be made in the following manner. After removing the triangular clamp and cover ascertain on which segment of the distributor the carbon brush rests. Then connect the corresponding plug terminal of the magneto to the spark plug of the cylinder in which the piston has been

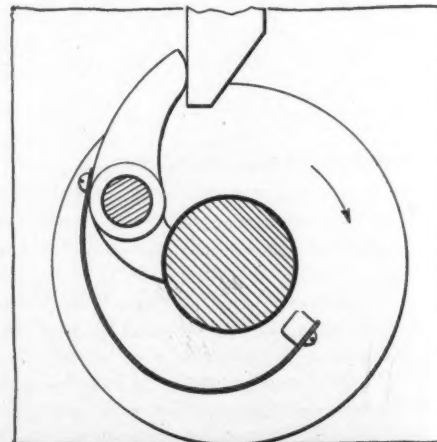


FIG. 6—EISEMANN CONTACT BREAKER

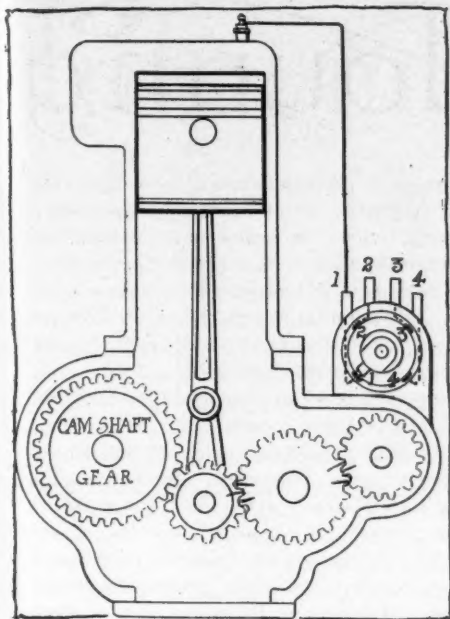


FIG. 7—MAGNETO TIMING GEARS

placed in position. Having placed the first piston into position corresponding to the segment of the distributor, on which the carbon brush rests, the remaining spark plugs should be connected up in the order in which the cylinders operate, but must follow consecutively the segments of the distributor according to direction of rotation. Finally replace dust cover and refix the connecting bridge between the terminals.

Eismann Magneto

To set the Eismann magneto, retard the ignition by pushing the lever as far as possible in the direction of rotation. Turn the motor by hand until the piston in the cylinder corresponding to the distributor contact in firing position is just beyond the dead center. Then turn the armature around until the mark on the cam is opposite the pin in the bearing plate and fix the driving pinion in this position. If the magneto is of the pivoting type, ignition is retarded by rocking the magneto as far as possible in the direction of rotation and the rest of the operation is the same as before.

In Fig. 7 is shown the magneto of a four-cylinder motor with the distributor in position for firing the charge in cylinder No. 1. It will be seen that the piston in that cylinder is at or just beyond the end of its stroke, and that the marks on the timing gears are together. So, then, we can set any magneto by reproducing the conditions in this sketch. Of course the method varies slightly with different magnetos, but the object of all is to get the parts in the relations shown.

2—In Fig. 2 are shown the relative positions of the piston, crank, magneto armature and contact breaker under the conditions of normal, advanced and retarded ignition. It is assumed for this illustration that the spark is advanced and retarded by moving the contact-breaker disk through an arc of 30 degrees each way from the normal position. The position of the arma-

ture of the magneto is not the same in all magnetos but the relative positions are representative of usual practice.

FORD CARBURETER ADJUSTMENT

Seattle, Wash.—Editor Motor Age—I will appreciate it if Motor Age will answer the following questions through the Readers' Clearing House:

1—How can the Kingston carbureter, used on the 1910 model T Ford, best be adjusted? I have to take the carbureter apart frequently to remove the water and it is very hard to get it adjusted just right again.

2—If one suddenly advances the throttle a good carbureter ought to respond, should it not? This carbureter spits and explodes irregularly, or the engine does.

3—If opening the throttle wide on a hill with the spark retarded results in uneven firing, would Motor Age consider this due to carbon, and what does it consider the best way of removing same without taking down the engine?

4—Can the Ford foot brake be adjusted so it won't grab?—Peyton Farrer.

1—The usual method of regulating the carbureter is to start the motor, advancing the throttle lever to about the sixth notch with the spark retarded. The flow of gasoline should now be cut off by screwing down the needle valve A in Fig. 1, until the engine begins to misfire; then gradually increase the gasoline feed by opening the needle valve until the motor picks up and reaches its highest speed, and until no trace of black smoke comes from the exhaust. Having determined the point where the motor runs at its best speed, the needle valve binding screw should be tightened to prevent the adjustment being disturbed. Sometimes the auxiliary air intake becomes clogged by dirt and this can be remedied by loosening

the nuts N and releasing the balls B.

2—If the carbureter is in good condition otherwise and adjusted as outlined above it should respond when the throttle is opened.

3—It would appear that the missing on hills is due to the carbureter and that you are not giving it sufficient gasoline. It not infrequently happens that with an adjustment that gives good results on the level the motor misses on hills. A quarter turn of the needle valve should overcome this trouble. Carbon deposit in the cylinders will cause trouble on hills, but not misfiring. At slow engine speeds, as when climbing a hill on the high gear, the incandescent carbon projections serve to pre-ignite the charge, thus reducing the power of the motor. The cure is to take off the cylinder head and scrape the carbon deposits from the top of the piston and inside of the cylinder head.

4—The service brake on this car can be relieved by removing the transmission case cover and turning the adjusting nut B, Fig. 2, to the left.

GETTING DRIVER'S LICENSE

Harvey, Ill.—Editor Motor Age—Will Motor Age kindly answer the following questions in the Readers' Clearing House columns:

1—I should like the address of the United Societies of Safety Appliances.

2—What age must one be to get a patent in the United States?

3—Where must one apply for a driver's license in Chicago, and who can get them?—C. S. H.

1—Motor Age cannot furnish it.

2—There is no age limit.

3—Applications for driver's license for Illinois should be made to the secretary of state, Springfield, Ill., who will furnish blanks and instructions.

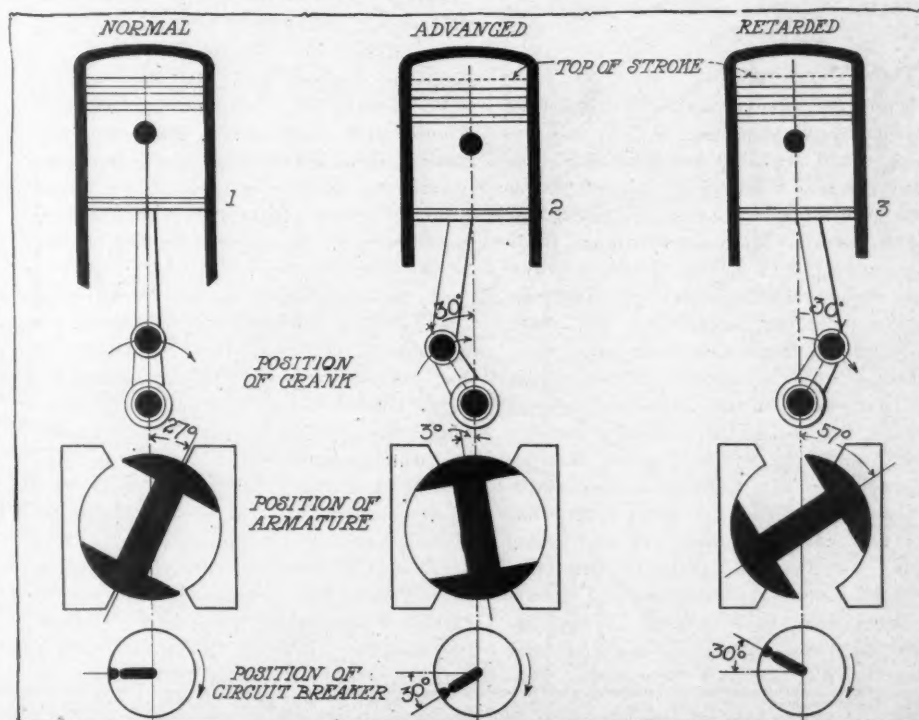


FIG. 8—POSITIONS OF PISTON, MAGNETO ARMATURE AND CONTACT BREAKER



Routes and Touring

In this department Motor Age will give information on routes and touring conditions. Suggestions on new or better routes are invited. All communications must be properly signed, as an evidence of good faith, but should the writer not wish his name to appear, he may use any nom de plume desired.



THREE TOURS, OHIO TO WASHINGTON. THE DOUBLE-LINE ROUTE IS THE 3-DAY TRIP ON THE NATIONAL HIGHWAY. THE HEAVY LINES INDICATE THE ROUTE OF A 7-DAY TOUR AND THE LIGHT LINES A TRIP COVERING 2 WEEKS VIA NEW YORK CITY

MANCHESTER, Ia.—Editor Motor Age—Will the Motor Age through the Routes and Touring Information Department plan a tour for me starting from Dayton, Ohio, about May 25 and going to Washington, D. C., returning to Chicago about June 15? I have ordered a Stoddard-Dayton foredoor touring car, and can get my car at Dayton on May 25 and wish to be in Washington, D. C., June 1 with a party of four people. Would it be pleasant to make the above tour at this time of the year? Will the road conditions be good? As it is necessary for me to be in Washington, D. C., June 1, would it be advisable to make this trip or go by train?—Dairy City.

A Three Day Trip

A trip of approximately 505 miles from Dayton to Washington, D. C., and one which would probably not take more than 3 days or 4 at the most is through Harshman, Fairfield and Enon to Springfield, where you strike the old National Highway and will find mostly excellent gravel pike roads following through Harmony, Vienna, Brighton, Somerford, Lafayette, W. Jefferson, Alton and Columbus.

Here you have an option of two routes, one continuing on the National Highway through Reyholdsville, Etna, Hebron, Jacktown, Linnville, Brownsville, Gratiot, Hopewell and Mt. Sterling to Zanesville, or the other which is 5 miles longer but over fine macadam, good dirt and gravel roads via Newark through Granville, Newark, Hanover, Nashport and Irville to Zanesville. Still keeping to the National Highway, taking in Cambridge and Wheeling, pass through Bridgeville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendrys-

DAYTON, O., TO WASHINGTON, D. C.

burg, Morristown, Lloydsville, St. Clairsville, Bridgeport, Wheeling, West Alexander, Claysville and Washington.

Between Cambridge and Wheeling there is a toll road most of the way, beyond that point you will encounter a hill road with many turns, patches of macadam; but most of the way either fair country road or worn pike. This is not a good road for rainy weather, but good time can usually be made in settled weather. From Washington traveling towards the coast go through Beallsville, Brownsville, Uniontown, Somerfield, Petersburg, Keyser's Ridge—an elevation of 2,328 feet and the highest point of the National pike—Grantsville, Frostburg, Eckhart, Cumberland, Flint Stone, Hancock, Clear Spring, Hagerstown, Funkstown, Benevola, Boonsboro, Middletown, Braddock, Frederick, Urbana, Hyattstown, Clarksburg, Gaithersburg, Rockville, Dupont Circle, to Washington, D. C.

If you desire to make a 7 or an 8-day trip covering approximately 828 miles you may go to Pittsburg from Wheeling, W. Va., touring through West Alexander, Claysville, Washington, Houston, Canonsburg, Bridgeville, Carnegie and crossing the Monongahela river, enter Pittsburg by the Point bridge. The 1908 Glidden tour is a good one to follow from here to Philadelphia and it passes through Wilkinsburg, Murrysburg, Export, Delmont, Five Points, New Alexandria, Blairsville, Little Washington, Armagh, Cramer, Coopersdale, Johnston, Geistown, Windber, Rummel P. O., Felix P. O., Pleasantville, Spring Meadow, Bedford Springs, Mount Dallas, Breezewood, Reamers, Har-

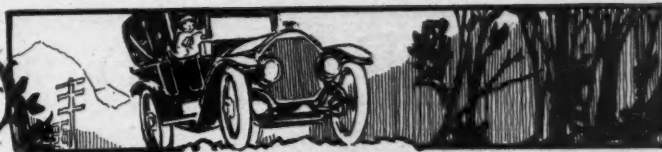
risonville, McConnellsburg, Fort Loudon, St. Thomas, Chambersburg, Shippensburg, Stoughtstown, Mount Rock, Carlisle, New Kingston, Camphill, Harrisburg, Steelton, Middletown, Elizabethtown, Rheems, Mt. Joy, Marietta, Silver Springs, Rohrerstown, Lancaster, Oregon, Ephrata, Adamstown, Shillington, Reading, Naumstown, Douglasville, Pottstown, Limerick, Collegeville, Jeffersonville, Norristown and Philadelphia. There is a section of the 1907 Glidden tour from Philadelphia to Baltimore which takes in Wayne, Malvern, Whitford, Caln, Coatesville, Black Horse, Williamstown, Paradise, Lancaster, Mountville, Columbia, York, Abbottstown, Hanover, Littlestown, Silver Run, Westminster, Carlton, Reistertown, Owingsmills and Baltimore. The Automobile Blue Book gives the balance of the way as Laurel, Hyattsville, Bladensburg, Station Square and Washington, D. C.

The 62 miles from Wheeling to Pittsburg is over a hilly road with many turns of either worn pike, fair country road or patches of macadam. From Wilkinsburg to Johnstown is clay and stone road, quite rough and narrow at times, with an occasional stiff hill; then fairly good pike from Cramer to Johnstown is encountered; after that the roads to Bedford gradually become better, with the exception of crossing the mountains between Rummel P. O. and Pleasantville. There are only fair country roads, up and down hills and mountains, between Bedford Springs and Fort Loudon; between Fort Loudon and Stoughtstown there is practically all fine macadam, and on to Harrisburg you will find good hard bottom with spots of neglected macadam road interspersed. In spite of innumerable water breaks, a little clay between Reading and Philadelphia, the run from Harrisburg to Philadelphia is a very good one, there being macadamized roadway practically the entire distance. Philadelphia to Baltimore will also present macadam roads practically the entire 171 miles.

Two Weeks' Tour

A trip of 10 days or 2 weeks, if you wish to stop and visit the different places of interest along the way, would be that of practically 1,290 miles by way of New York, Albany, Rochester, Buffalo, Cleveland and Toledo to Chicago. After following the path traced out in the 7-day trip from Washington, D. C., to Baltimore, the Official Blue Book gives a route of 108 miles to Philadelphia and which is through Towson, Lock Raven, Glenarn, Belair, Churchville, Havre de Grace, Perryville, Northeast, Elkton, Newark, Marshalltown, Wilmington, Chelsea, Village Green, Chester, Norwood, Darby and Philadelphia.

Information



None of these routes between these two points are of the best, but the Blue Book recommends this selection.

This route takes you on to New York over macadam practically throughout by way of Ogontz, Fox Chase, Bustleton, La Trappe, Langhorne, Oxford Valley, Trenton, Mercerville, Edinburg, Windsor, Hightstown, Cranbury, Dayton, Deans, New Brunswick, Metuchen, Iselin, Rahway, Elizabeth, Newark, Harrison, Jersey City; and to Albany through Columbus Circle, Yonkers, Irvington, Tarrytown, Ossining, Peekskill, Cold Spring, Fishkill Village, Wappingers Falls, Poughkeepsie, Hyde Park, Rhinebeck, Red Hook, Blue Store, Hudson, Stockville, Stuyvesant Falls, Kinderhook, Schodack Center, East Greenbush and Rensselaer. Covering a distance of 314 miles, taking in Syracuse, Rochester and Buffalo, you will pass through Schenectady, Esperance, Sloansbill, Carlisle, Sharon Springs, Springfield, Warren, Richfield Springs, Winfield, Bridgewater, Sangerfield, Madison, Bouckville, Morrisville, Nelson, Cazenovia, Oran, Fayetteville, Syracuse, Camillus, Wellington, Elbridge, Weedsport, Port Byron, Spring Lake, Savannah, Clyde, Lock Berlin, Lyons, Palmyra, Macedon, Fairport, Rochester, Scottsville, Wheatland Center, Mumford, Caledonia, Lime Rock, Le Roy, Stafford, Batavia, Bushville, Pembroke, Clarence, Williamsville and Buffalo.

Following the south shore of Lake Erie from Buffalo motor through Woodlawn Beach, Wanakah, Evans Center, Farnham, Irving, Silver Creek, Sheridan, Fredonia, Brocton, Portland, Westfield, Ripley, State Line, North East, Harbor Creek, Wesleyville, Erie, Fairview, Girard, East Springfield, West Springfield, Conneaut, Amboy, Ashtabula, Saybrook, Geneva, Unionville, Madison, Painesville, Mentor, Willoughby, Euclid and Cleveland. Here the 1907 Glidden comes in use again through Rocky River, Dover, Bement, Ridgeville, Elyria, Amherst, Henrietta, Birmingham, Berlinville, Norwalk, Monroeville, Bellevue,

Clyde, Fremont, Woodville, Lemoyne, Stony Ridge, Toledo, Java, Swanton, Delta, Wausean, Archbald, Stryker, Bryan, Edgerton, Butler, Waterloo, Kandalville, Brimfield, Wanaka, Ligonier, Millersburg, Goshen, Elkhart, Osceola, Mishawaka, South Bend, New Carlisle, La Porte, Westville, Valparaiso, Wheeler, Hobart, Highlands, Hessville, Hammond and Chicago. There are practically all good dirt or macadam roads throughout the entire return trip.

If you wish to make little detours from this main route you could not do better than follow those mapped out in the Official Automobile Blue Book, which gives the points of interest to visit, mileage from town to town, land marks, hotels, garages and maps, in fact everything necessary for such tour.

NO SAND AT FORT MORGAN

Fort Morgan, Colo.—Editor Motor Age—In Motor Age issue of March 16 under the head of Routes and Touring Information on page 24 as to a good route from Waterloo to Los Angeles, we note you advising an inquirer from Waterloo to go from Julesburg to Cheyenne and then to Denver, "thus avoiding the sand in and about Fort Morgan." We wish to say that there is no sandy road from Julesburg to Denver via Fort Morgan. The Box Elder and Kiowa creeks have good concrete bridges and the commissioners of Morgan county and the state highway commission are putting in a concrete bridge across the Bijou. So there will be no sand whatever from Fort Morgan to Denver. All the sandy road has been covered with hard dirt. The writers have been over the road from Fort Morgan to Denver eight times in the past 2 months and there is only one or two places where it is necessary to drop

a gear at all and that will be overcome as soon as the Bijou bridge is completed.

These improvements have been and are being made as a result of a meeting of the county commissioners of Colorado in conjunction with the state highway commission held at Denver some time ago. They are making the road from Julesburg to Denver via Fort Morgan and Living Springs a state road and consequently more money is being expended over the entire route than would be the case were the various counties to build it alone. This road is a good one and we do not want the general public to be misinformed as to this fact.—Chamber of Commerce, Streets and Highways Committee.

DECATUR, ILL., TO INDIANAPOLIS

Illioipolis, Ill.—Editor Motor Age—Will Motor Age, through the Routes and Touring Information department, please map out a route for me from Decatur, Ill., to Indianapolis, Ind.? Will we have any hard roads in Illinois and what is the distance?—Subscriber.

It is a distance of 172 miles from Decatur to Indianapolis, and you will pass through Maroa, Monticello, Savoy, Champaign, Villa Grove, Newman, Hume, Metcalf, Chrisman, Dana, Highland Corners, Montezuma, Rockville, Bellevue, Hollands, Bainbridge, Winchester, Danville and Indianapolis. You will find this route over a level country most of the way, with good dirt, gravel or macadam roads.



TOURING ROUTES IN CLEVELAND AND ITS SUBURBS, WITH BEST ROADS TO OUTLYING POINTS
PREPARED BY THE OFFICIAL AUTOMOBILE BLUE BOOK

The Realm of the Commercial Car



SAURER CROSSING TRACKS

BIG TRUCK TRAVELS OVERLAND

AL. WESTGARD, who is piloting a 5-ton Saurer motor truck from Denver to the Pacific coast, is making this journey as a representative of the office of public roads of the United States government, and will submit to the department of agriculture an exhaustive report with recommendations of highway improvements at the conclusion of this journey.

On the run from Denver to Trinidad the party encountered many stretches of wet adobe, some of them on 20 per cent grades. At three distinct places bridges had to be shored up and the load of lumber was frequently drawn upon for planking bridges and making corduroy in sandy arroyos. In spite of all care exercised in examining every bridge carefully, the truck broke through the flooring of two bridges, and also entirely destroyed one wooden culvert. These incidents occupied several hours of time in extricating the truck from its precarious position. Near Walsenburg was encountered a terrific sand storm, so dense that the party could not see 50 feet ahead. The tourists also passed through a heavy blizzard Sunday afternoon south of Walsenburg. Upon arriving at Huerfano creek it was decided that it was too risky to attempt the quicksand in the ford, and a detour of 20 miles was made to find a gravel bottom.

The expedition reached Albuquerque, New Mexico, March 23, via Santa Fe. While in Santa Fe Mr. Westgard had a conference with Governor Mills, who expressed himself as being much interested in the project and pledged himself to lend all possible support to the improvement of the route. Mr. Westgard, in his report to the government upon the completion of his

trip last fall, stated that Bernalillo county, New Mexico, had the worst roads of any part of the entire trans-continental route. This severe criticism brought results, as this county has now raised \$10,000 towards the improvement of roads, and especially the route in which Mr. Westgard is interested.

Upon leaving Las Vegas some very rough going was experienced, more particularly in the neighborhood of the village of Trecolote. Governor Mills stated, however, that the entire route from Santa Fe to Las Vegas will be graded and put in good condition at once; in fact, gangs are now at work on various portions of the route. From Glorieta to Santa Fe, a distance of about 25 miles, the party found a new road graded all the way; also, from Santa Fe south as far as Algodones, a distance of about 38 miles. Some heavy going was experienced, however, on portions of this road, owing to the fact that it is constructed, in a major part, on a sandy barren. The tread of the motor truck being 64 inches, it could not avail itself of the track made by other vehicles, but was compelled to make a new track for itself on one side, which consumed a great deal of its power. Below Algodones it was necessary to strengthen seventeen small bridges

over irrigation ditches, and this consumed time. At one place the truck broke through one of these bridges, although the bridge was newly constructed and appeared strong. The top planks, however, were of too light material to stand the tremendous weight of the truck.

Westgard remained in Albuquerque a day or so in order to reconstruct the load so as to be in the best possible manner prepared for the very rough going expected west of Albuquerque. He intends to deviate some from the route laid out by him last fall. That route, for pleasure cars, he considers the most scenic of any that he has ever traversed, but owing to the long wheelbase and tread of the truck, he is afraid that, in the present condition of the roads, it would be impossible to safely pilot the truck over portions of it. Hence he intends to keep on the west side of the Rio Grande to San Antonio, where the river will be crossed on an iron bridge, thence going north on the opposite side of the river to Socorro, and heading west through Magdalena and Rito Quemado to Springerville, Arizona, at which point he will rejoin his route of last fall. This detour will necessitate considerable more mileage and will not present nearly such interesting country, but will offer better road surface.

MOTOR MAKES GOOD IN DETROIT

Police Commissioner Frank H. Croul, of Detroit, before the committee on ways and means of the common council last Thursday, gave the motor car full credit for saving Detroit from an epidemic of crime during the past year. The commissioner appeared before the committee in connection with his estimates for the coming fiscal year. He was trying to con-



SAURER AT FOOT OF THE BLACK MESA IN MEXICO

vince the aldermen that the growth of the department had not been commensurate with that of the city, pointing out that while the city had increased in area from 17 to 42 square miles in the last decade there were now only four more men doing patrol duty than in 1900.

"Our motor squad is all that has saved the day," he told the committee. "Without it I would have been helpless. It is the one thing that has prevented the town from being overrun with crooks. It is the best investment the city ever made as far as the police department is concerned."

The commissioner was able to show a substantial saving in expenditures for hay, grain and bedding as a result of the adoption of motor patrol wagons, the difference more than counterbalancing the cost of maintaining the motor service. For this fund he asked only \$6,000 this year as against \$10,500 in 1910, and was allowed \$5,000 by the committee. He also showed a big decrease in horseshoeing bills. In the way of new equipment the commissioner asked for three runabouts to be used as auxiliary flying squadrons, and these were allowed without question.

The committee on fire protection allowed the fire department \$17,000 for two new motor fire engines, \$4,000 for four runabouts for battalion chiefs, \$1,500 for a new car for the fire chief, \$1,000 for a new runabout for the telegraph department, \$1,000 for a motor trouble wagon and \$6,000 for rebuilding the aerial ladder into a motor ladder truck. The fire commissioners showed how the purchase of the two new motor fire engines would make it unnecessary to build three new fire engine houses at a cost to the city of more than \$100,000. The new apparatus will replace two horse-drawn engines and will cover far more territory than is now covered by the latter. That the superiority of the motor car is fully appreciated by the city officials is evident from the fact that every item asked for by both the police and fire departments in the way of new motor equipment was granted, while other items, except salaries, were badly slashed.

LONDON BUS SERVICE

An interesting proposition is the motor bus matter, which has now got to a substantial basis in London. The London General Omnibus Co. has obtained complete control of the London bus traffic by an amalgamation with the various smaller companies; in fact, it has more than regained the position which it held prior to the first appearance of the motor bus on the streets of London.

At one time the London General Omnibus Co. and the Road Car Co. practically controlled 90 per cent of the buses running. Some 5 years ago a motor omnibus company, namely the Vanguard Co., commenced operations with a large number of motor buses. This company put up a very formidable opposition to the existing concerns, and the price of the stock of the existing companies fell at an enormous rate.



WESTGARD CAMPS OUT NEAR SPRINGER, NEW MEXICO

The two old companies above named put on a number of mechanically-propelled vehicles in order to meet the new requirements, but with very indifferent results. The stock of the London General Omnibus Co., with a par value of 100, was, before the inauguration of the motor-propelled vehicle, sold at 200. The value of this stock gradually fell, until about 18 months ago it was quoted at 17 only. This company has now by the amalgamation with the Road Car Co. and the Vanguard Co., completely regained its position, and the present price of the stock is nearly at par.

This company has recently bought up the only serious competitor, namely the Great Eastern Omnibus Co. It is anticipated that by the end of this year the horse omnibus will have completely disappeared from the streets, and that there will be some 1,500 motor omnibuses in operation.

The London General Omnibus Co. has erected works for the construction of its own omnibuses, and now is turning out a very efficient and silent machine. The chief feature of this machine is the chain-driven gearbox and the worm-driven rear

axle, which means complete silence in running is effected. The cost of running this new omnibus is considerably less than the best of its predecessors; the gasoline cost alone has been brought down by 33 per cent, which is a most important matter considering the heavy tax imposed upon the bus company in the shape of gasoline duty.

It is anticipated that the real battle between the two rival forms of street conveyances, namely, the motor omnibus and the electric tramway, is about to begin. The report of the board of trade traffic branch recently issued states that anything like finality with the omnibus is not yet in sight; invention is active, omnibuses continue to be made, and the omnibus of the future may be as superior to the newest pattern of today, as the latter is to its predecessors.

It is largely upon such construction that the hopeful outlook of the industry depends. It is remarkable that while the cost of running motor omnibuses is on the decline, the expense of electric tramways is on the increase. Only a few days ago



CROSS-COUNTRY TRUCK ON ITS WESTERN JOURNEY



COMMISSIONER RHINELANDER WALDO IN NEW YORK'S NEWEST FIRE ENGINE

Edward White, chairman of the London county council highways committee stated that the receipts per car mile of the London county council system have fallen from \$3.32 in the early days of the undertaking, to \$3.20, and he further states that if the decline in the tramway revenue continued the council would have to increase its fares or place a charge for tramways upon the rates. At the same time the board of trade tramway returns for 1909-10 of British electric tramways show that there has been a greater increase in current consumption than in car mileage.

An advantage that the London motor omnibuses possess is the superior speed, and in spite of the obstruction of the tramway it can always beat the electric tram car, and is thus finding great favor with the public.

MONTREAL WANTS BUS SERVICE

The inauguration of a motor bus service for the island of Montreal is the scheme which J. B. Baillargeon expects to have in operation throughout the city by the beginning of the coming summer.

Mr. Baillargeon's proposal, which has been most favorably commented upon by the city controllers and aldermen alike, aims at the amelioration of passenger traffic conditions at the principal transfer points of the city during the rush hours of the morning and afternoon. The service will run on 30-minute schedule from 6 or 7 a. m. to midnight. Mr. Baillargeon declares that he is only waiting for the formal assurance of the city fathers that the \$15 tax which he would have to pay on each vehicle would remain fixed for a certain period, perhaps, 4, 5 or 6 years, to go ahead with the organization of his company, which will be incorporated as the Autobus Co. of Montreal.

It is the idea to start with twenty buses distributed throughout the city, as well as a suburban service. The uniform rate of fare will be 10 cents inside the city limits. Outside of this a fixed charge per mile will be made by the company.

New York Adopts Motor Fire Service

A STEP forward in the general adoption of the motor-propelled fire engine was taken in New York city 10 days ago when the new Nott motor car fire engine was given a severe test by Fire Commissioner Rhinelander Waldo, Chief Croker and his assistants. The trial consisted of a speed run and pumping test and the engine made 40 miles an hour and threw 753 gallons of water a minute, which was ten miles an hour and 53 gallons a minute more than the specifications called for. It was a biting cold day with considerable snow on the ground.

The engine reached the scene of the blaze, quenched it and returned to the fire house in 11 minutes. It was on the ground several minutes before any of the other equipment, despite the fact that it had to travel considerably further than the others. The Nott engine is built by the Nott Fire Engine Co., Minneapolis, Minn.

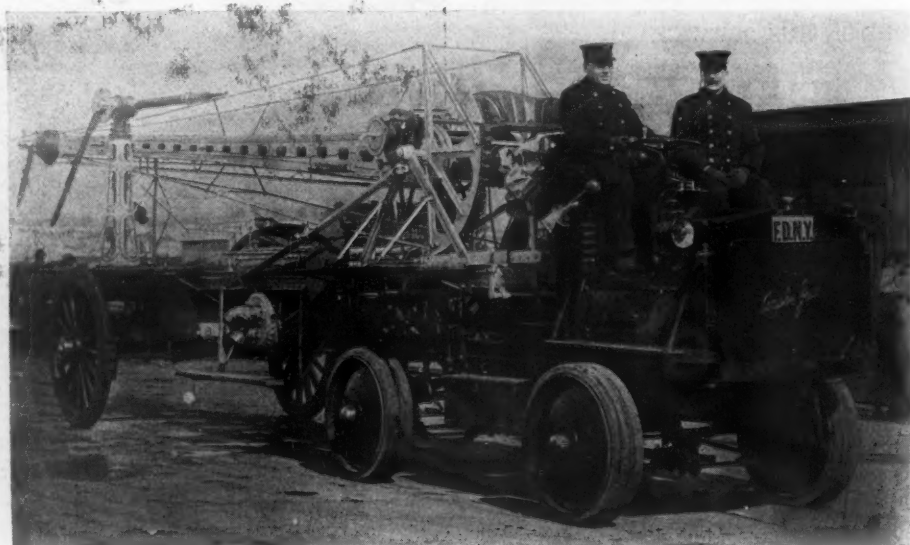
The machine cost the city \$9,772, but

additional engines of the same kind will be furnished at \$6,000. Commissioner Waldo was sufficiently impressed with the test to make the announcement that the whole fire department will be equipped with motor car engines probably in from 4 to 6 years.

The Nott engine weighs 16,000 pounds. Its motor is rated at 110 horsepower. Only the motive power is derived from gasoline, as the pump itself is operated by steam.

The power plant of the Nott fire engine is a vertical four-cylinder motor of the long-stroke type with intake and exhaust valves carried in the cylinder heads. The clutch is a cone type covered with raybestos and of large diameter, with a 6-inch face. Speed changes are through a selective type with three forward variations. Chrome nickel steel gears are used.

The Nott company claims to be able to change present horse-drawn fire engines to the motor-propelled type. In order to do this the horse-drawn engine has to be



COUPLE GEAR CHASSIS USED AS LADDER TRUCK IN NEW YORK



KNOX WITH HIGH-PRESSURE ENGINE USED IN NEW YORK

And Tries Out the New Nott Engine

shipped to the company's factory, where the necessary changes are made.

The argument in favor of the motor car engine as it is advanced from the records of the New York fire department are that it costs from \$700 to \$800 a year for shoeing and feeding the horse equipment of an engine, while the total cost of upkeep and operation of the motor car engine, as indicated in the cost bills of the high-pressure trucks and hose carts already installed, is from \$50 to \$100 a year, including gasoline and oil.

There are now six motor cars in service in the fire department, and four more are en route to the city. Twenty-eight other machines, mostly hose carts, have been ordered.

The Nott engine will be known as No. 58, and has been stationed at One Hundred

and Fifteenth street and Madison avenue, a post that usually has about 1,000 fire alarms to answer each year.

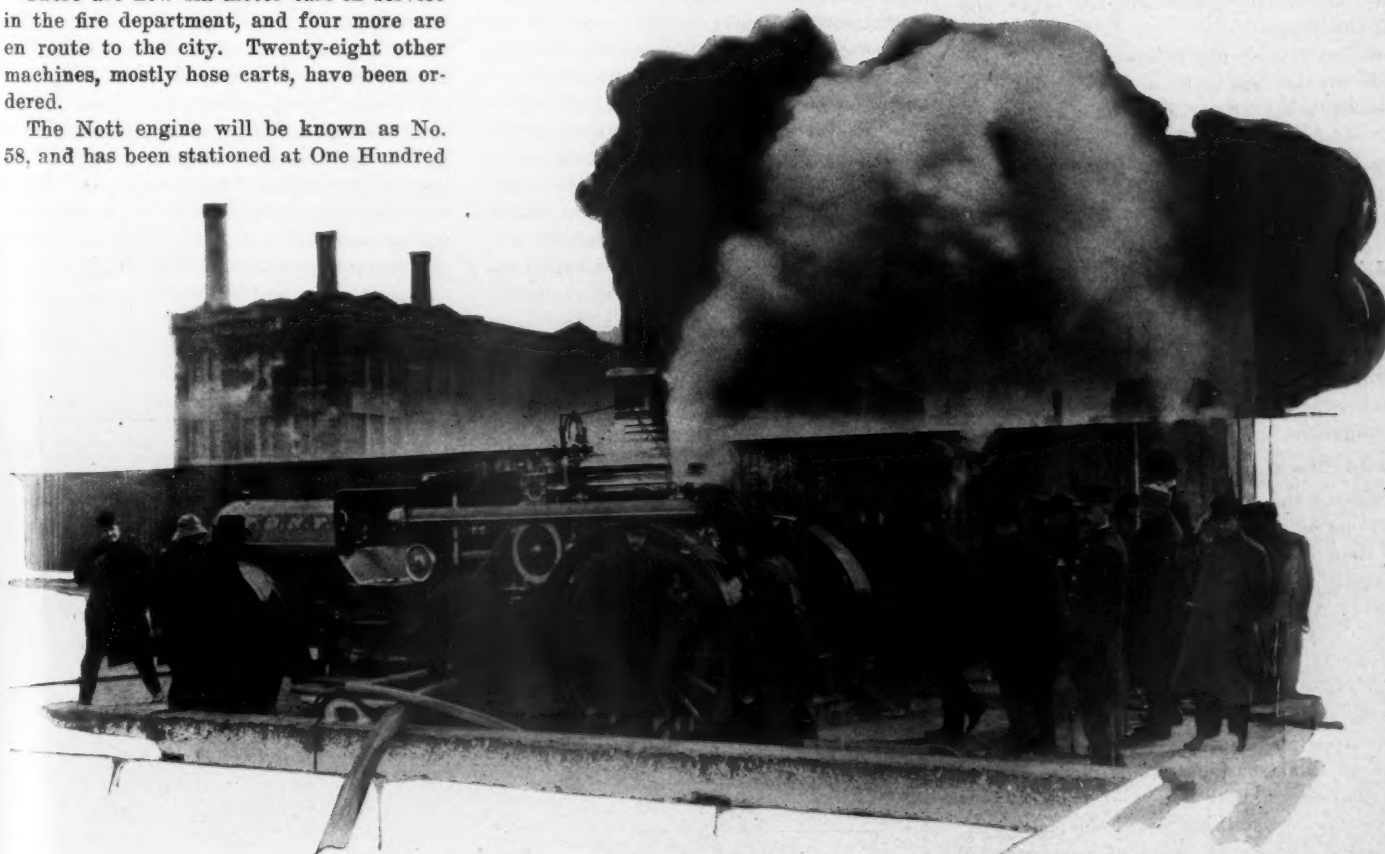
HORSES MUST GO

Forty-two horses, all unsuspectingly toiling for the Portland Gas Co., of Portland, Ore., are about to lose their jobs. The edict was issued during the past week, when the company's superintendent of construction submitted a report showing that horseflesh is hopelessly outclassed by gasoline in the work of moving some 20 or 25 tons of cast iron pipe per day.

Last July General Manager Pabst of the Portland Gas Co. ordered two motor trucks as an experiment, one of 1-ton and the other of 2-ton capacity. From the first day the superiority of the service was evident and a careful record of the loads moved, time consumed and outlay of expense every day since the motor truck service was inaugurated shows some rather startling comparisons. The company's records for the past 8 months show that the 2-ton truck, which was later rebuilt into a 3-ton, carried twice the load handled by the company's heaviest wagon and does it in half the time, thus giving practically four times the service.

HARTFORD CONVERTED

The Pope Mfg. Co. is building two more cars for the fire department of Hartford, Conn., one being a roadster for the chief and the other a hose wagon. It has been decided by the board of fire commissioners to add motors as fast as the old apparatus shows signs of wear, and to add at least one wagon annually. Hartford's experience with motor car fire-fighting apparatus has convinced the commissioners that it is much better than the horse-drawn apparatus, the motor engines and hose wagons getting to the scene of the fire quicker and able to prevent fires which would be serious if the apparatus was slower in arriving; that the expense is less if there is any difference, and that the general results are better. It is significant that the commissioners state that they will buy no more horse-drawn apparatus and will depend upon the motor as soon as all the horses go.



NOTT MOTOR-DRIVEN FIRE ENGINE BEING DEMONSTRATED IN NEW YORK



The Motor Car Repair Shop

Oil Transfer Pipe

A VERY unique and handy device employed in the stock room of the Coward company, Kansas City, Mo., is a simple means of transferring oil from a barrel into the steel supply tanks from which it is measured out to the customers. The device is an L-shaped pipe construction such as is shown in Fig. 2; and it is made entirely from standard pipe fittings and a tire valve, which are readily obtainable at a very reasonable cost. The principle under which the operation of transferring the oil is performed is that of introducing compressed air into the barrel and thereby forcing the oil through the pipe P, which conducts it into the oil reservoir as indicated. The air under pressure is forced into the barrel by means of combination of pipe fittings and a tire valve, arranged on the long leg of the pipe P. The details of this combination are shown in the sectional drawing in the center of the illustration. It is comprised of a standard 1 or 1 1/4-inch pipe union with a packing gland at one end, a nipple N with a tapering lower end and a regular tire valve T tapped into the side of the union as indicated.

To make the illustration more correct, the nipple N should extend up almost to the packing gland and a little packing or hemp or the like shown squeezed between the ends of the gland and the upper end of the nipple.

In operation, the tapered threaded portion of the nipple N is screwed into the wooden sides of the bung-hole at the top of the barrel, and the horizontal or short leg of the pipe P arranged so that the oil will flow into the receptacle desired; then the compressed air hose from a tire pump or storage tank is attached to the valve T and air forced into the barrel. Care must be exercised, however, so as not to put too much pressure into the barrel or it will burst. When oil is cold it does not flow as readily as when warm and one must bear this in mind when using a device of this nature.

Avoid Use of Hammer

Among the foolish things that motorists and motor car repairmen have from time to time been known to do a new one has recently been seen. The old, but oft repeated foolish things above referred to are: Cranking the motor with the spark advanced, feeling into the gearcase while the gears are in operation, starting the motor while the gears and clutch are in an operative position, etc. The new one is not so disastrous, but quite unnecessarily painful for a short period of time, and it consists in striking the enameled or painted surface of a metal part with a hammer so that the paint chips off and

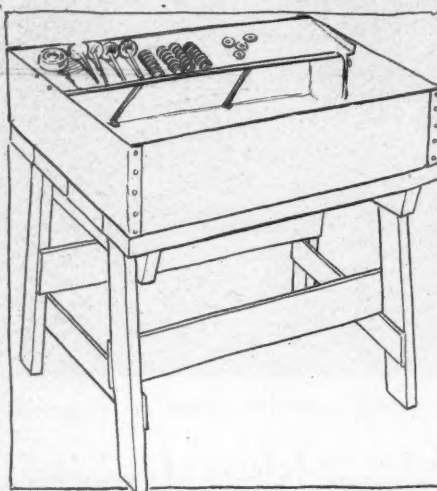


FIG. 1—HANDY BOSTON CLEANING BASIN

flies into the eyes. This, of course, is not a new experience, for doubtlessly it has happened to many, but it is hoped that by making mention of it the reader will be on his guard should he be called upon to drive a spring shackle bolt with a painted head, or a spring clip or the like, into place.

A Gasoline Room

In the repair department of the Chicago Motor Car Co. is a commendable novelty in the form of a gasoline room. It is a small room with cement floor and fireproof walls and ceiling. In this room all the cleaning of car parts by gasoline is done. It is the only room in the repair department in which gasoline is allowed. There are several advantages in such a system. The danger of fire is lessened, which is perhaps the biggest feature. It enables a better ventilation in the repair department. It is not conducive to good workmanship to have a repair department filled with fumes of gasoline. It is more cleanly to have the gasoline room by itself. In

a repair shop cleanliness and order are big factors. Without them it is hard for a good workman to do a good job. Where the floor is cluttered up with gasoline cans, tools, loose parts and dirt, the workmen are always more or less confused. The conglomeration has a bad effect upon him. The cleaner and neater the repair shop the more work done and the better the work.

A Handy Cleaning Basin

When a motor car is brought into a repair shop for an overhauling the first thing that is done to it is the disassembling of its various mechanisms and the thorough cleaning up of the component parts of each. It is thus that the worn or damaged parts may be found. In order to facilitate the cleaning of the various motor car mechanisms many different forms of cleaning tanks, baths and bathing solutions are employed; in fact, in the most completely equipped repair departments separate rooms with elaborate cleaning outfits are to be found. In Fig. 1 is shown a very simple and practical design of cleaning basin, such as is in daily use in the Peerless branch repair shop at Boston. It is a galvanized iron receptacle about 8 or 10 inches deep, 4 feet wide and 5 or 6 feet long; and it rests on a metal stand of substantial construction. It has a slanting shelf at the rear, which is attached at either side and supported by two partitions as indicated. This shelf is the feature of the construction. It provides a clean place on which to place articles which have been cleansed with kerosene and brush and from which the oil may drain off of them and flow back into the basin. This receptacle is half full of kerosene, it stands about waist high and is large and strong enough to conveniently hold a motor, gearset or rear axle case or the mechanisms contained therein.

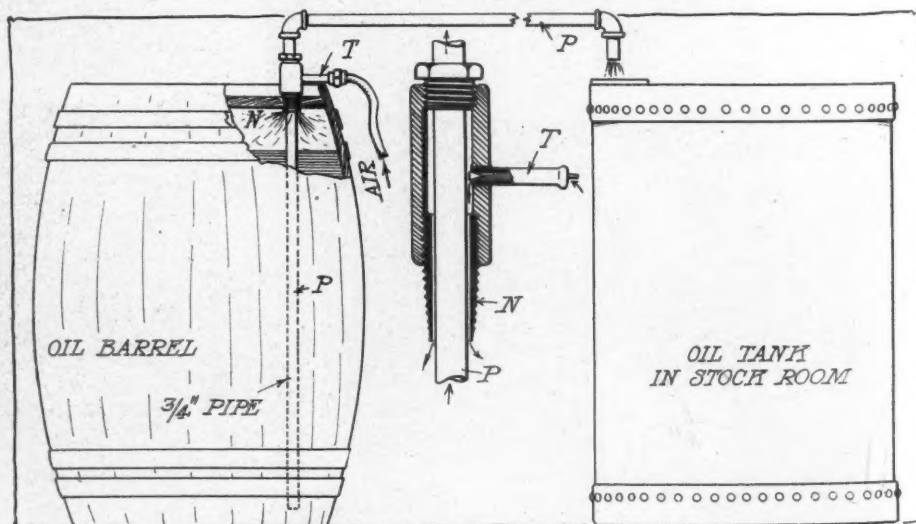


FIG. 2—OIL TRANSFER PIPE USEFUL FOR GARAGE WORK

Little Car Interests France

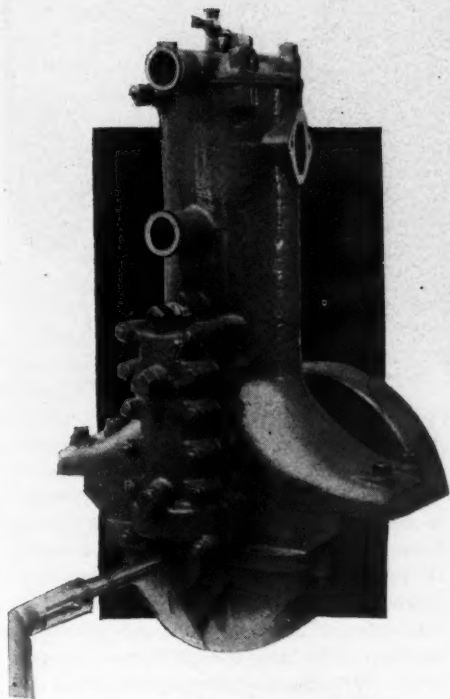


FIG. 1—THE C. L. C. MOTOR

THERE is a growing interest in France in the light two-seater capable of being sold complete at \$500 to \$600. Gradually, but surely, the firms which secured a reputation with cheap single-cylinder models have moved forward to larger four-cylinder models to the neglect of the original type. With the great increase in small four-cylinder models the somewhat powerful single-cylinder models—despite the fact that they have been developed until they are quieter than most four-cylinder motors—have fallen out of fashion. The \$900 car must now have four cylinders; the single-cylinder one is only admitted for the lightest type of two-passenger runabout. Less work being required of it, the single-cylinder motor has fallen in size from $4\frac{1}{2}$ or even 5 inches bore to only a little over 3 inches.

Two examples of these light runabouts are to be found in the C. L. C. and in the Ruby voituresses. The former pos-

Growing Demand for Light Two-Seater Selling at About \$500—C. L. C. and Ruby Are Two Examples—Army Experiments With Searchlights—Some Fore-Door Ideas

sesses a single-cylinder valveless motor of somewhat unusual design, having a bore and stroke of $3\frac{1}{10}$ and $5\frac{1}{2}$ inches. The motor is forward, behind a gilled-tube radiator, the flow through which is by thermo-syphon. The motor and gearbox are carried on a subframe attached to the main chassis by three-point suspension. A multiple-disk clutch running in oil is provided; the gearset is of the sliding type, giving three forward speeds, with both shafts mounted on ball bearings, and final drive is by propeller shaft.

The motor, which is without doubt the most distinctive feature of the small car, is of the valveless type, having a certain similarity with the Knight. Within the cylinder are single sleeves having a continuous rotary motion and at the same time an alternative rectilinear movement. As will be seen from Fig. 2, the rotary motion is obtained by means of bevel gears G, a vertical shaft S and the spur pinion P meshing with a crown gear B on the lower portion of the sleeve. This mechanism merely assures a continuous rotary motion of the sleeve between the cylinder walls and the piston. But at the same time the sleeve has an up-and-down motion, which is obtained by the rather ingenious method of the ball A, imprisoned in a suitable housing and engaging in the helical groove A1. The sleeve being obliged, by reason of the ball and groove, to move up and down within the cylinder, it is necessary that the gearing B should be arranged helically, and parallel with the groove A. This does not change the nature of the gears, but allows the two to keep in engagement despite

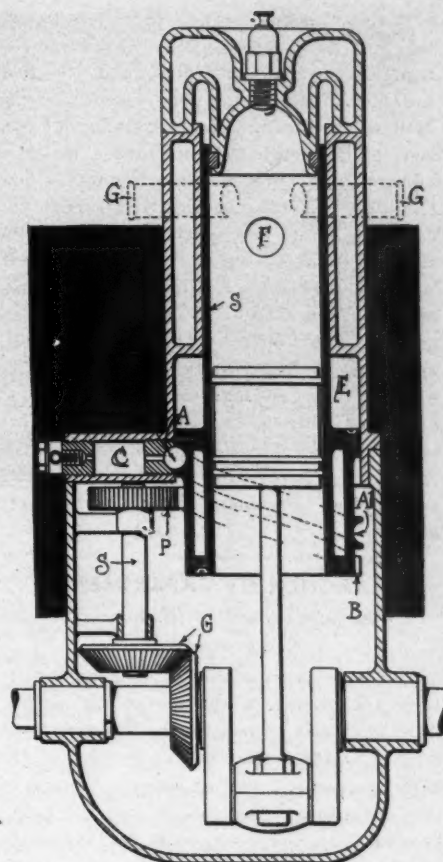


FIG. 2—SECTIONAL VIEW OF C. L. C. MOTOR

the alternating motion of the sleeve. In the upper portion of the walls of the cylinder is the intake port G, and opposite it the exhaust port G. Corresponding with these are two holes in the sleeve, one of which is shown at F, assuring the admission of the fresh charge and the exhaust of spent gases. The design allows of a hemispheric type of combustion chamber, with spark plug in the head of the cylinder.

Contrary to general single-cylinder practice, the crankcase is divided horizontally. Complete accessibility is given to the gearing and the ball A by a demountable inspection plate on the lower portion of the casting. By withdrawing a series of bolts, it is possible, indeed, to dismount the vertical shaft S, together with the spur P and bevel pinions G mounted on its two extremities. For the lubrication of the ball and groove a chamber C is provided back of the ball, with a supply of oil constantly maintained within it under pressure.

The second small car, known as the Ruby, is also a single-cylinder model, of $3\frac{1}{2}$ by $4\frac{7}{10}$ inches bore and stroke. The motor follows standard lines, being of the L type, with mechanically-operated valves, high-tension magneto, the Zenith carbureter, and splash lubrication. The distinctive feature is the use of friction drive, which has never enjoyed a great amount of popularity in Europe even for light cars. The entire power plant—motor and speed system—is carried on a subframe, which is practically a reduction of



C. L. C. NEW TYPE OF FRENCH RUNABOUT

the main chassis. Thus the countershaft carrying the driven pulley is mounted in bearings on the subframe, and the final drive is taken to the rear axle by means of a single chain. The chassis layout consists of the single-cylinder motor, mounted vertically in front under a bonnet; a continuation shaft extending to the rear and carrying on its end a friction disk; and a sliding friction wheel on a crossshaft. A single chain transmits from the crossshaft to the rear axle. The car has few other really distinctive features, but it is endowed with particular interest at the present time by reason of the fact that at least two important French firms are making tests with friction-driven cars in the hope of being able to produce a really satisfactory runabout selling at \$500 to \$600.

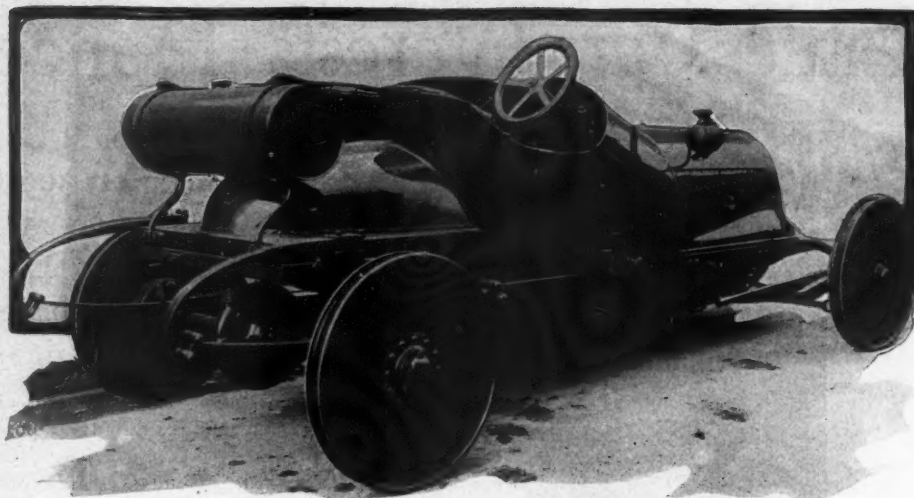
SEARCHLIGHT EXPERIMENTS

French military authorities believe the idea is a practical one.

The importance attached by French military authorities to the motor car searchlight is clearly shown by the acquisition of twenty of these vehicles for service on the eastern frontier and at various points of the coastline. The latest and most improved type has been built for the army by Harlé & Co., of Paris, who are responsible for both the motor car and the electrical equipment.

The Harlé Searchlights

As the result of experiments it has been possible to build the Harlé motor car searchlights with a total weight, fully equipped for the road, of only $3\frac{1}{2}$ tons, and of this amount the searchlight is responsible for 930 pounds. The car consists of a special truck with an 18-horsepower motor carried under a forward bonnet. The cylinders are cast in pairs, with a bore and stroke of 3.5 and 5.1 inches, valves being on one side. The high-tension magneto is carried across the front of the motor. With a view to long service at a fixed point, the cooling has been given special attention, the water circulation being by pump, with a fan back of the large tube radiator. Gasoline is the fuel employed, although the firm also has perfected a kerosene type of carbureter to be used when the vehicles have



FOUR-CYLINDER GREGOIRE WITH FORE-DOORS, BOAT BODY AND STEEL-COVERED WHEELS

to operate in districts where gasoline is not readily obtainable. As the carbureter is automatic and the ignition point is fixed, motor control is entirely by accelerator pedal when on the road, with a dashboard lever for regulating the motor when generating current only.

Other Mechanical Features

A four-speed gearbox is fitted, with the ratios worked out so as to provide a speed of 20 miles an hour on the open road, together with an ability to climb grades of 15 to 18 per cent, hill-climbing ability being naturally a very important feature in an army searchlight. The clutch is of the metallic disk type, working in oil. Final drive is taken from the countershaft sprockets to the rear wheels by means of side chains. Unusually powerful brakes are fitted on the road wheels and on the gearset.

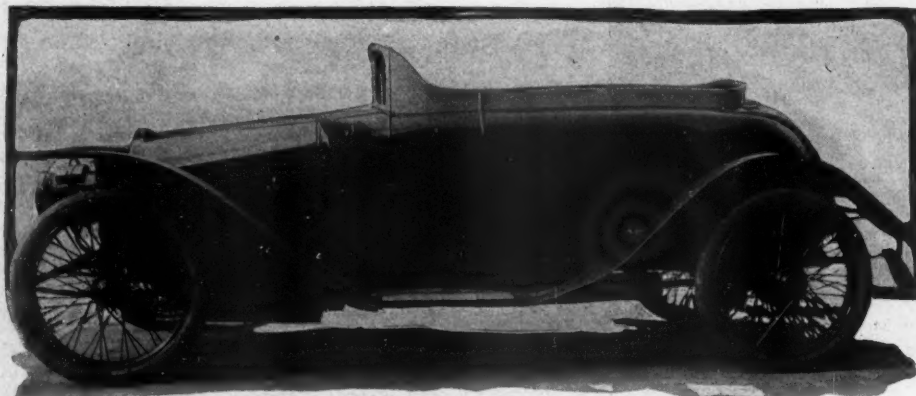
The driver's position is the usual one, but his seat is sufficiently wide to allow of two other men being carried by his side. With their backs to these three men and carried on seats mounted on the top of large tool chests are the two other men, completing the crew of five usually mounted when on active service. It is possible to carry a sixth man on the rear platform provided for the man in charge of the searchlight when the vehicle is at rest. Immediately behind the driver's seat is mounted a reel of highly insu-

lated cable, which is employed when it is desired to operate the searchlight away from the car. This is 320 feet in length. It is possible for the searchlight to be moved to the most advantageous position when that position is not attainable by the entire vehicle. This is particularly advantageous for mountainous districts or coast defense work.

Operation of Searchlight

The searchlight is pivoted between two vertical arms attached to a revolving base mounted on a light bogey with metallic rubber-shod wheels. The bogey itself is well suspended by means of coil springs, thus protecting the searchlight against road shocks when traveling at speed, and at the same time allowing it to be wheeled across country without danger. It is securely held in position by means of quick-operating clamps receiving the ends of the two axles of the bogey. To keep the center of gravity as low as possible the wheels are of small diameter and are carried on rails level with the lower portion of the frame members. In the majority of cases it is not necessary to dismount the searchlight, for although kept as low as possible with a view to safety at speed, it is sufficiently high for the light to clear all the surrounding mechanism and can be trained in any direction. If it is desired to dismount it, however, two rails are available under the bogey, and by means of these and a suitable cable and pulley the whole can be placed on the ground by one man. Generally, however, three men are employed, the operation then occupying less than 1 minute.

In addition to the advantage of placing the searchlight away from the car the Harlé company has devised an electrical distance operating mechanism, allowing the officer in command to place himself nearly 1,000 feet from the searchlight and yet control all its movements—raising, lowering, turning to left and right, opening or closing the shutter, with the same precision as if he were mounted on the operating platform. The distance



AN EXAMPLE OF THE FRENCH FORE-DOOR BODY STYLE

command has the advantage of allowing the observer to study the object on which the light is focused with much more ease than if standing by the side of the lamp. **Dynamo Combined with Flywheel**

The dynamo, which is combined with the flywheel of the motor, has a capacity of 120 amperes at 80 volts. Always being in motion when the vehicle is under way, it allows the searchlight to be employed at a moderate intensity even when traveling. The face diameter of the searchlight is 35 inches. The reflector is a metallic type patented by and produced by the Harlé company.

The accessory equipment of the car is most complete. Two large chests mounted on the sides of the truck contain tools and spare parts for both the car and electrical plant. In a large chest under the rear platform is a spare reflector, and other accessories carried are a field telescope and a portable telephone. The motor has a gasoline supply sufficient for 8 hours' running at full charge, and under ordinary road conditions it will average 13 miles to the gallon. The lighting of the vehicle is made independent of the electrical plant. It consists of oil side lamps and an acetylene headlight, this latter capable of being darkened instantaneously from the driver's seat, and the oil lamps having hinged covers.

FORE-DOOR IDEAS POPULAR

Designers Now Provide Protection for Occupants of the Front Seats

So strongly has the fore-door idea caught on in Europe that not one touring car in a thousand is now being turned out of the French body factories without protection for the occupants of the front seats. The improvement is even being extended to closed cars, so that numerous landaulets and limousines have full protection for the driver. But the French motorist is not satisfied with having side



FRENCH SEARCHLIGHT IN ACTUAL OPERATION

doors added to the ordinary touring body merely as an afterthought; what he needs is either a pure torpedo or something approaching the lines of a torpedo. So great is the demand for this class of work that sheet metal workers are reaping a fine harvest. Formerly French bodies were mostly built of wood, with sheet metal for the panels of the cheaper grade of cars. But wood cannot be used for the curves of a torpedo, and every firm capable of handling sheet steel is loaded up with work.

The vogue of the torpedo has led to the development of streamline forms, and the creation of a type of body altogether unknown a couple of years ago. An excel-

lent example of this is to be found in a boat body built by Alin & Liautard for the Gregoire Co. on an 18-horsepower chassis. The body follows absolutely the lines of a motor boat, with a combing around the well, raised in front so as to give protection to the driver. There is one entrance on each side, admitting to the front seats, while the rear seats are reached by folding up one of the front ones. The stern of the car is particularly interesting, for the downward sweep is made to embrace the rear axle, thus making the under surface of the car as clean-cut as the upper portion. It is obvious that a car of this type gains enormously over the standard models at the high speeds attainable on good French roads.

Body Maker a Factor

Up to the present head resistance has been given little attention by body makers, and it is only since aerial experiments have shown the large amount of power necessary to drive an unsuitable type of body through still air at high speeds that motorists have begun to realize that it is the body maker as well as the carbureter manufacturer who can help them to economize gasoline. It must be admitted that a body such as that shown in the illustration has its limitations in the matter of luggage capacity, but this will not prevent more and more attention being paid to the problem of reducing head resistance.

Another innovation by the same firm of body makers is the fitting of light steel disks over the spokes of a car wheel. This has frequently been done for track racing, with very satisfactory results, but manufacturers have not previously thought it worth while to apply the improvement to a touring car or runabout. In addition to offering less resistance the disks have the great advantage of simplifying the washing of the car. As any car washer is aware, the four wheels of a car require more time than the whole of the body. This new body saves considerable labor and time.



ONE OF THE HUGE FRENCH SEARCHLIGHTS—THE HARLÉ

WORM VS. CHAIN DRIVE

BUFFALO, N. Y.—Editor Motor Age—I am surprised at the following editorial, "Worm vs. Chain Drive for Motor Trucks," which appeared in a recent issue of Machinery on the merits of worm drive for motor trucks. The editorial follows:

The compactness and simplicity of the worm gear are generally attractive to mechanical engineers and designers, and many have been led against their better judgment to use it in devices for which it is not suitable. Of all ordinary transmission mechanisms the worm gear requires the best workmanship, both in making and in mounting, to secure maximum efficiency; and even when everything possible has been done to make for the best efficiency, still it is relatively low. When high speed ratios are required in small space, in devices with few parts, or the self-locking feature is important, the worm is the ideal transmission to use, but if other transmission gear of high efficiency and durability can be used, why use something inferior?

A movement in the design of motor trucks to be deprecated is toward the use of the worm drive in the transmission to the rear axle, a worm and wormwheel taking the place of bevel gears. We believe the move will be disastrous if generally followed by the builders of motor trucks, because reliability is required first of all in cars for commercial uses. Neatness of outline and freedom from noise are prime considerations in pleasure cars, but it appears like poor design to employ a rear axle in a heavy truck containing the differential and a worm drive, in place of the plain axle and a parallel lay shaft carrying the differential and chain sprockets for the intermediate transmission to the wheels. The latter form of drive is easily repaired; drivers can make shift to get along if one side is badly damaged, and are doing it every day. Hooking the rear wheel into an obstruction with force sufficient to bend the axle does not necessarily put the truck out of running, but it surely would if furnished with the worm drive and differential in the axle. Another disadvantage of the latter is the greater dead weight—that is, weight not spring supported—carried on the rear wheels as compared with the load carried by the differential rear axle type. The chain transmission gear may not be pretty, but if increased as it should be, it is comparatively noiseless, highly efficient, long-lived, and simple to repair.

These statements made are opposed to the experience of the very considerable number of engineers who have now for years been engaged in building motor cars, both pleasure cars and trucks, equipped with worm drive live axles. Let me say at once that unless the best workmanship is available any kind of worm gear is best left alone. This article states that the efficiency is at best "still relatively low." At this point it becomes evident that modern practice and modern engineering literature have alike been overlooked. The efficiency of worm gears properly designed and correctly mounted is as high as 95 per cent. This statement is made from my own observation and can be calculated from the formula:

$$e = \frac{1 - \mu}{1 + \mu} \frac{P}{\eta D}$$

where μ = coefficient of friction.

P = axial pitch of worm.

D = pitch diameter of worm.

Confirmation of this is given by Fred A. Halsey in his handbook on worm and spiral gearing published in New York in 1903, reproduced, I believe, from articles in the American Machinist. Any engineer may therefore verify this fact for himself. Since, however, the efficiency is said to be "relatively low" it may be inter-



Manufacturers'

esting to turn to another authority in our attempt to find something higher.

In the Automobile Trade Directory published in January, 1911, on page 746 will be found a table by Worby Beaumont, an engineer of high professional standing in England and himself the consulting engineer to the Royal Automobile Club, who may, therefore, be supposed to speak with some authority. This table gives the efficiency of various types of transmission mechanism. Here it will be found that one set of gears will absorb 5 per cent of the efficiency and two chains 6 per cent, or a total of 11 per cent, giving for a bevel and chain transmission of the usual type a total efficiency of 89 per cent against 95 per cent for a worm transmission.

Were it possible to employ for a large truck a single final bevel reduction, the efficiency of the bevel gear would be equal, but not superior to, that of the worm gear; owing to the size of gear which this would involve such an arrangement is not possible, however, and chains must be employed, making the further reduction in efficiency referred to. Beaumont's figures, however, are for new chains and it is a fact well known to all engineers that the efficiency of chains falls off rapidly as the chains become stretched, and the sprockets worn in use, so that the 89 per cent when new is probably as low as 75 per cent long before the chains are worn out. It therefore is difficult to see in what way the efficiency of worm gear is "relatively low," particularly when it is remembered that the wearing of a worm and worm wheel does not reduce its efficiency at all, owing to the fact that the tooth sides are flat and remain so in spite of wear.

The article next makes mention of the "self-locking feature" or worm gears. It is not a little curious that this point is so frequently brought up—it is so obvious that no motor car could exist with a worm gear were it not possible to coast as freely as with a bevel, that it is difficult to conceive any engineer building such a machine unless he had first proved the fallacy of this impression.

Irreversible worm gears are so common in, for example, elevators and the dividing heads of machine tools, that the uninitiated are apt to overlook the geometrical principles on which the operation of any worm gear depends, and which make it an easy matter for the designer to make the gear reversible or otherwise at his option; it is only a question of varying the gliding angle, which always is a function of, never equal to, but greater than, the spiral angle.

As to durability, which is the next point raised, trucks fitted with worm gear

are in general use in England and have been for the last 7 or 8 years. In London omnibus work, where 3-ton chassis are employed in what is admitted to be the severest work which can be found, worm gears have given satisfactory results for the last 5 years.

I have before me as I write a letter from the operating engineer of Thomas Tilling, Ltd., who owns and operates a large fleet of public service vehicles in London, in which he says:

"The average life of a worm drive on an omnibus is between 28,000 and 30,000 miles; now that we have redesigned the torque rod the life should be 40,000 miles."

I have yet to find any chain which will in average working approach one-half this distance.

Reliability is much the same as durability, but as the two are mentioned separately in this article I will deal with them in the same way, merely observing that, to take only one example, Dennis Brothers, who were the pioneers of the worm drive for trucks, always have given a specific guarantee of 2 years with every worm-driven rear axle they have made, and their range of models has for 5 years included those of 5 tons capacity. Has any manufacturer of other forms of drive exceeded this?

Lastly, this article introduces the old argument of complication and unsprung weight and all the disadvantages thereof. This is such an old friend, those of us who have had some experience in the motor car industry have lively recollections of precisely similar objections when the gear drive was first substituted for chains in the lighter vehicle, such of us as are familiar with present day practice also know how far they were removed from truth.

The analogy between pleasure cars and trucks is largely in favor of the latter, inasmuch as their slower speed is in their favor size for size, the destructive effect of shocks, etc., being measured by the energy stored in the vehicle, or any part of it.

WV²

Since energy = $\frac{WV^2}{64.4}$ foot-pounds, it

follows that destructive action will vary directly with the weight and directly with the square of velocity, hence it is an easier thing to make a live axle for a truck than a pleasure car, because of its lower speed.

With regard to repairs, it is obvious that a broken chain can be easily repaired; it is equally obvious that such repairs are unnecessary if no chains exist. If a worm gear will last from 30,000 to 40,000 miles, as it does, it may be assumed that roadside repairs are not a frequent occurrence

Communications

and as far as the axle itself is concerned it becomes a problem of every day mechanical engineering to design what will be strong enough for the purpose.

Lastly, the whole question of worm drive for motor cars is regarded as a new and obscure thing—not fit to be understood. That it is so in this country must be the result of accident or prejudice. It was past the experimental stage 10 years ago in England and such names as Lan- chester, Napier and Daimler in pleasure cars and Dennis, Halley and Leyland in trucks, not to mention many others, should be sufficient guarantee that the worm axle is a practical and reliable proposition.—H. Kerr Thomas, Pierce-Arrow Motor Car Co.

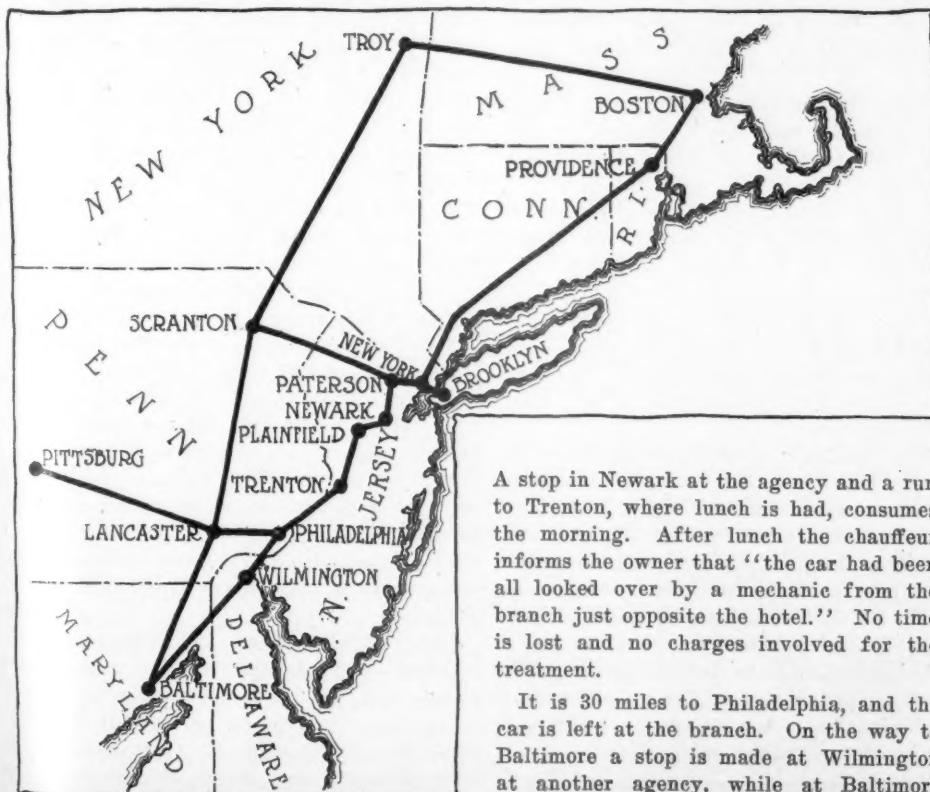
ASSISTING THE TOURIST

Philadelphia, Pa., March 18—Nothing can be more disappointing to the tourist on a 2 weeks' vacation trip through the country than to be tied up in some out-of-the-way place for 3 or 4 days because of breaking some part of the car, and having to wait until the repair part, which has to come from the factory perhaps 1,000 miles away, is obtained. It is bad enough to have the break which in nine cases out of ten may be due to an accident or some carelessness, but is ten times worse to have to waste a holiday waiting around some hotel or garage. It takes but 1 hour to telegraph for the part but the uncertainty of railroad connections and express companies has to be reckoned with. Many factories have well-equipped branches, but

even then there is danger of a prolonged delay. An example, however, of what is being done in this matter is the system of branch houses and agencies fully equipped to look after the tourist, which is maintained along the Atlantic seaboard by the Dayton Motor Car Co. These may be termed "Convenience Controls for Owner Tourists." Appreciating that the word convenience is subject to many interpretations, the word on its direct application may explain the intent: If the owner lays out an itinerary through the best touring country of the east, he will keep within the boundary of middle New England and central Maryland, going no further west than Pittsburg. A real tour in this section would embrace the following points: Boston, Providence, New York, Philadelphia, Baltimore, Pittsburg.

Starting from Boston, and leaving at that point a factory branch, the tourist makes New York an objective, passing through Providence, where another factory branch is located. Skirting along the sound, over good roads, he reaches New York. Just to see that the car is all right, a stop at the branch satisfies him on this point. An owner's identification card secures gasoline, oil and a spare tube at home prices.

Long Island, with its attractive roads, gets due consideration, and there is another direct factory branch home in Brooklyn which could be made the supply base—during a trip over the island. The tourist decides to continue south through Jersey.



A STODDARD-DAYTON TOUR

A stop in Newark at the agency and a run to Trenton, where lunch is had, consumes the morning. After lunch the chauffeur informs the owner that "the car had been all looked over by a mechanic from the branch just opposite the hotel." No time is lost and no charges involved for the treatment.

It is 30 miles to Philadelphia, and the car is left at the branch. On the way to Baltimore a stop is made at Wilmington at another agency, while at Baltimore there is another one.

The following morning the chauffeur reports a leaky radiator, due to a bad strain, one which showed up bad workmanship at one point in that delicately made feature. Down go the spirits of the tourist for a minute, as he pictures either a protracted delay for repairs or for a new radiator from the factory. But this depression is quickly dispelled when the branch manager shows a new radiator of the right size, that is to go on in place of the old one. No charge, too. "Yes, the radiator shows bad workmanship, and that you're guaranteed against," is his cheering remark. The tourist is beginning to realize his ideal of how a car owner can feel when perfectly happy.

Granted that there are better roads than the tourist finds going up the Cumberland Valley, it would be difficult to beat the scenery, and impossible to find any section affording more interest. The traveler now is among the famous battle fields of the civil war. What does a good or a bad road mean to any American whose mind is occupied with memories of the battle of Gettysburg?

Running through Lancaster county, this country's premier county in the value of its farm products, the motorist rolls through the city of that name and stops at the factory branch there for a fresh supply of oil and gas. Again a mechanic, who knows the car, looks it over, and finding that the trip over roads filled with water breaks and rocks hadn't done any injury, the trip is resumed, to spend the night at Harrisburg, where there is a live agent.

Leaving Harrisburg the next noon he follows up the Susquehanna to Sunbury, a beautiful river ride, where he puts up for the night, and comfortably, too. The agent there is located right next to the hotel.

The next stop is Scranton, and there is found the ninth factory branch, in addition to the three in Brooklyn, Paterson and Plainfield that hadn't been visited. With a scant hour spent while the shop foreman there looked over the car, the tourist is able to breathe freely in the knowledge that three-quarters of the tour has been finished.

Getting accurate directions as to the route from the local branch manager in the morning, the tourist starts for Binghamton, eating luncheon there. In Troy is found another branch. Leaving Troy and running through Catskill and Poughkeepsie, the tourist is en route for the Berkshires. A night stop almost anywhere is enjoyable, and by noon the next day Boston is reached.—W. P. Berrien, Stoddard-Dayton Co., Philadelphia.

RADIATOR TERMS DEFINED

Detroit, Mich.—Editor Motor Age—We have noticed with interest an article appearing on pages 22 and 23 of the issue of Motor Age, March 16, in reply to an inquiry received from Bardstown, Kentucky, on the subject of radiators, and feel that there are one or two inaccuracies in the statements which should be corrected.

In the first place the terms "cellular" and "honeycomb," as applied to radiators, have been so generally misused that a layman or, for that matter, many well posted makers and dealers, do not thoroughly understand them. Of course, technically, a true honeycomb radiator would be one made with hexagonal cells and not square ones, whereas the term cellular would cover hexagonal, square and round cells. In general practice, however, nearly all radiators of this type are now made with square cells, but the method of construction is so radically different that the name applied to all makes is really a misnomer. In the term, tubular radiator, there also is a chance for a misunderstanding because, while, as in the case of the McCord radiator, round tubes and flat fins are used, other makers use oval or oblong tubes with flat and crimped fins. Some have even gone so far as to put a false front on tubular radiators imitating the cellular type, and these are being advertised by makers as cellular or honeycomb radiators.

As a matter of fact, the line between the two types should be drawn on the basis method of radiation, which may roughly be called direct and indirect. The true cellular belonging to the first category, and the fin and tube to the latter. The point is simply that a number of the high class cellular radiators, so called, are in reality fin and tube radiators because the water circulates in flat vertical passages only, corresponding to the tubes of our radiator, and the horizontal structure of the cells is nothing more nor less than fins. It has been our experience that this indirect form of radiation is more efficient than the direct, and tests made at various times have proven this to be a fact.

Therefore, when Motor Age states to its readers that the true cellular or honeycomb type of radiator is more efficient, it is not entirely correct. As a matter of fact our standard radiator is fully as efficient as any cellular radiator, when all factors are considered. By this we mean that for the equivalent amount of weight we can show equal or greater efficiency than the cellular but, of course, for a given square of front surface with a given depth the cellular would show the greatest efficiency.—P. L. Barter, Sales Manager, McCord Mfg. Co.

LIKES NEW CONTEST RULES

Indianapolis, Ind.—Editor Motor Age—As to the new A. A. A. contest rules, I am thoroughly in favor of them and so is every manufacturer who is in the racing game for the real good of the motor industry and for the education of the public. Under the new rules, there will be closer mechanical inspection by a paid technical committee of experts. In the past the best possible supervision could not be had, owing to the fact that the technical committee gave its services gratis and naturally could not be expected to devote as much time to its work as it will under

the new arrangement on a salary basis. Much closer inspection will result in the elimination of contestants who are inclined to evade the rules and will safeguard the public, who are not familiar with the full details of what constitutes a strictly stock car.

One of the most important additions to the rules is the one which compels each maker to carry in his advertising the registration number of the model with which he wins races. The A. A. A. contest board assigns registration numbers to each stock model. A certain series of numbers cover stock cars of 1909; another series those of 1910 and still another series of numbers will cover stock cars of 1911. Under this arrangement, the public will know whether the car winning a race on the track is a model of the current year, or an obsolete model which the manufacturer has discontinued building, possibly

TEST OF SOLIDIFIED GASOLINE

London, March 15—The use of solidified gasoline in the motor car is described in a recent issue of The Car. The test was made with a six-cylinder Fiat and the apparatus for carrying the solidified gasoline consisted of a long metal box fixed on the top of the left step. At the bottom of the box were six pipes through which the exhaust from the motor passed. A few inches above the pipes was a grid carrying blocks of solidified gasoline. In fact, the whole space above the grid was filled with blocks dumped in and pressed in place by hand. The grid divided the gasoline into sections, thereby opening surfaces to the action of the air. A pipe led directly from the front end of the box to the motor, no carburetor being used. The suction of the engine drew air over the blocks of gasoline, vaporizing enough to give the desired mixture.

After the engine had been running a minute or so, and the exhaust pipes in the box had become heated, an adjustment of the air was necessary and an improvement in the running took place. The car performed well, pulling evenly and slowly on top speed, and there was an increase of power with considerable reduction in consumption of gasoline. As the blocks of gasoline became used the ends of them became dry, which finally resolved into a white dust. The bottom of the box was hinged and this dust was emptied out.

The solidified gasoline vaporized so readily that a heavier grade than ordinarily used can be successfully adopted, and it is stated that a mixture of 40 per cent petroleum and 60 per cent gasoline gives good results. It is very easy to carry the blocks and if they are set on fire they can be easily extinguished.

A further demonstration was given showing its use for lamps. It supplied two headlights, two side lights and a tail lamp for 70 hours at a cost of 62 cents.



because it was not properly constructed for general service. In the past, under the old rules, a manufacturer could race an obsolete stock model and by the wording of his advertising, create the impression in the minds of the public that that obsolete model which won a race was the same model which he was delivering to his customers during the current year. The public will very shortly familiarize itself with the meaning of these rules.

This new rule is a movement in the right direction, and for the first time in the history of motor racing the manufacturer who really races stock chassis in both the letter and the spirit of the rules, will get the full credit due him, and the public will be afforded an index by which it may gauge with entire safety the performance of the cars they are going to buy.

Another benefit that will accrue to the public is that the manufacturers will be constantly on the alert to improve each year's product, so that no succeeding year's performance will fall below that of the year before. In this way the public will get the full benefit of motor racing, as it will not only be the greatest sport on earth, but will be a most valuable demonstration of the car's ability to back up the claims the manufacturer makes for it.—George M. Dickson, National Motor Vehicle Co.

SIDELIGHTS ON EUROPE

Racine, Wis.—Editor Motor Age—After spending 3 months in Europe, during which time I visited the fifteen sub-agencies of the Mitchell-Lewis Motor Co. on the continent and installed an American system of accounting, I find American cars are making remarkable headway in Europe. Because of the American road conditions, which are infinitely worse than anything one can find in Europe, our cars are more strongly built. In Europe the manufacturer only sells the chassis. Then the customer goes to the carriage builder to make the body, for which he has to wait 3 or 4 months and pays three or four times the price he would have to for quantity-manufactured bodies. The American car is sold complete, because of which foreigners are beginning to like our methods better. In this country a man buys a car in the morning and kicks if he doesn't get it in the afternoon, and the same spirit is now partially invading Europe, much to the discomfort of the continental manufacturers, one of whom recently said to me: "You Americans commercialize your product too much. You make 5,000 cars all the same. I build 100 and no two are alike. I have reduced car building to an art."

I told him that we had reduced car building to a science. Imagine what an owner is up against in France when he has to buy each special part for replacement on account of lack of standardization.—Henry Plow, Assistant Treasurer, Mitchell-Lewis Motor Co.

The A B C of a Modern Reliability Run

Securing of entries should generally be carried out by the entire contest committee, which committee should meet at least once a week, and oftener if possible. This committee can operate to the greatest economy and advantage by dividing the field of possible entries among its different members so that the entire force is not concentrating on any one dealer or manufacturer. Entries should be obtained as well in advance as possible and no entry should be accepted unless accompanied by the required entry fee. It is generally best to assign official contesting numbers to the entries as received, as it stimulates early entries in order to get low numbers. The entry money should be handed over to the treasurer of the contest committee, who opens a special account with some bank, keeps a cash book and reports the standing of the funds at each committee meeting.

One last and important feature of every contest committee is a secretary. Generally the majority of committees consist of a chairman and some others. This is a mistake; there should always be a secretary and a treasurer. By distributing the honors the work and responsibility are also distributed. It makes the committee work better. The secretary keeps the minutes of all meetings, looks after the correspondence and frees the chairman of much drudgery and leaves him free to look over the general supervision of the work, which is his field.

Educating Officials

As stated at the opening of this article, one of the big problems of a reliability contest is to get the officials and contestants to understand the rules. Start with the officials and start 1 month before the contest opens. Have a series of three meetings for the explanation of rules. Have all of your officials, referee, checkers, etc., on hand. Read the rules over carefully, ask questions on them and conduct a regular kindergarten. This should be superintended by the referee, whose duty it is to become familiar with every detail of them. He alone is responsible for the contest and he should expound the meaning of the rules. He is the captain of the ship of contest from start to finish and on his shoulder hangs every criticism, consequently he should be the tutor of every one connected with the work.

To familiarize the contestants with the rules requires two meetings, the first held two nights before the opening of the contest and the last one on the eve of the contest. All drivers and observers must be present, as well as the officials and the official representatives of the different cars entered. At these meetings go over the rules with some order of sequence. Take the observers first, explain them their duties, see that they are in possession of

(Continued from page 7)

good watches and put an observer's card in the hands of each. Ask them to record some incident that might happen to a car; for example, a stop of 3 minutes to repair a fan belt, a stop to take on gasoline outside of a control, a stop to take off a tire chain, a stop occasioned by a frightened horse, etc. If this is done by each observer, collect the cards and note the results. If they are wrong show them where. All of this work must be done in advance. If it is not there will be some ignorant observer the first day who fails to take out his watch and note the length of time; at the end of the day he will try to guess how long the stop was and your trouble will have begun.

The Important Kindergarten

When you have schooled the observers and asked them individual questions as a teacher would his or her class at school, then go to the drivers. Start with them from the garage and take them over an imaginary trip for the first day's run. Bring out what they do when they reach the official garage at 6 in the morning, what they do at the starting line, what they do at the noon and night controls,

when they can stop their motors, what to do in case the motor stalls, what to do with the motor when repairing tires, what they can do in the way of oiling at noon controls, what they can do in the 45 minutes at night control, etc. In this way go over the entire field of the contest, meeting every possibility. This done, ask the different drivers, calling them by name, to answer different questions to make sure they understand. This meeting may last 4 or 5 hours.

The second meeting on the eve of the contest is shorter. It is given over to asking questions to see if drivers or observers understand the rules. Generally the drivers and observers have many questions to ask. They have been reading the rules over and have run against many difficulties. These have to be cleared up. With this done, all is in readiness; the rules are understood and every preparation has been made, nothing remains but to wait for the 4 o'clock alarm, a hasty breakfast and meet at the garage. Observers should be on hand one-half hour before the starting time, so should the drivers. By this precaution the drivers can get to their cars in company with the observer and get out of the garage 15 minutes before the time of the start.

Some Legal Lights and Side Lights

OWNERS MUST PAY EXPRESS

As a result of a decision handed down by Supreme Court Justice Alden Chester, at Albany, N. Y., Secretary of State Lazansky will be enabled to save to the state upward of \$25,000 in the delivery of number plates. The decision follows a test case brought by Royal W. Scott of Canandaigua for a peremptory writ of mandamus compelling the secretary of state to deliver to him at his residence his number plates. Mr. Lazansky took issue upon the same and opposed the motion.

Secretary Lazansky has held that, according to the Callan law, he is not compelled to deliver to car owners their number plates at the expense of the state. His idea has been to send out the plates to those applying for them by express C. O. D., or have the owners call for them at the various sub-stations established by the secretary in various cities.

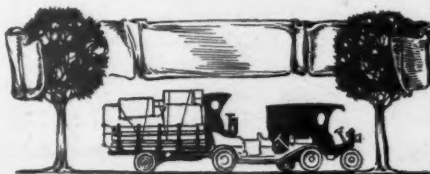
Justice Chester in the opinion holds that, according to the Callan law, the secretary of state must issue and deliver certificates

and number plates to owners of cars "at the place of issuance," and he says this means at the office of the secretary of state. He therefore denies Judge Scott's motion without costs. As only a question of law was involved in this test suit, an alternative writ was not granted.

ALL MUST CARRY LIGHTS

The New Jersey law providing that all vehicles must carry lights went into effect when Governor Wilson signed it last week. Any person found guilty of a violation of its provisions is liable to be haled before any justice of the peace or other magistrate having jurisdiction and fined not less than \$2.50 and not exceeding \$5.

A bill of this character was passed in 1909, but the penalty was only \$1, and this was to be sued for. The method of enforcement provided rendered the act practically inoperative. The new law makes enforcement possible by summary process. The act provides that every vehicle drawn by horse or other beast shall carry during the period from 30 minutes after sunset "and 30 minutes before sunrise," and whenever fog renders it impossible to see a long distance, at least one lighted lamp, which shall throw a light at least 250 feet toward the front and behind.





From the Four Winds



A NOTHER Oil Convert—The county of Clare, Mich., will try a new experience on its roads this summer, the plan being to oil the highways, a scheme which has proved successful in other parts of the state of Michigan.

Trucks Collect Garbage—Seattle has recently put in a motor truck service for the collection of garbage. The trucks will be equipped with huge metal bodies as carriers. Five large Mack trucks are now in service carrying garbage from the different centers to the crematory.

Progress of Motorette—The little Motorette which recently started out from Hartford, Conn., on a 5,000-mile journey to San Francisco, is making satisfactory progress toward its goal. The Motorette now is in the neighborhood of Charlotte, N. C., and will continue on through Greenville, Atlanta, Birmingham, Little Rock, Dallas, El Paso, Juarez, Tucson, Phoenix, San Diego, Los Angeles, and from there to San Francisco.

Medal for Schuster—George Schuster, who drove the Thomas Flyer in the New York-to-Paris race in 1908, was rather surprised a few days ago in Boston when he received the gold medal struck off for him in honor of his feat. This medal was sent to be engraved in 1908 and then forwarded to the factory, where it was mislaid and forgotten until a few days ago, when one of the officials found it. All the time it was in the drawer of a desk among some papers. President Chalfant immediately sent it to Schuster, who is at the Boston branch, with a letter explaining the circumstances.

Club Merger at Grand Rapids—At a meeting of the joint committees of the Highland Golf Club and the Grand Rapids Automobile Club it was decided to consolidate the two Michigan organizations to form a holding company capitalized at \$75,000. Stock will be sold at \$100 a share. The club probably will be known as the Highland Golf and Automobile Club of Grand Rapids. An option has been secured on a piece of property on Clinton road, just outside the city, and the present plan is to erect a \$50,000 clubhouse on this site. The clubhouse proposition, however, awaits the action of the state legislature, which is considering a bill to make the annexation of territory adjacent to cities easier. The members of the clubs are waiting to see how this bill comes out before building. The members do not desire to build a clubhouse and then have the property annexed to the city, a proceeding which greatly would increase their taxes. Temporary officers of the combined clubs have been appointed as follows: Chairman, John Hoult; vice-chairman, Alvah Brown; secretary, Dr. F. C. Warnshuis; treasurer,



RECRUITING MEMBERS FOR CHICAGO MOTOR CLUB IN QUINCY, ILL., DURING SHOW HELD THERE LAST WEEK

Peter Payett; organization committee, Van A. Wallin, Charles A. Phelps, G. A. Hendricks, Elmer Kinzey, R. H. Owen and C. C. Cargill.

New Canadian Club—A. E. Pfeiffer has been elected president of the Quebec Automobile Club and Major J. D. Brosseau is secretary. The club starts with a membership of fifty.

Seeking Better Roads—The Roseburg Automobile Club met last week and formulated plans for the betterment of roads leading out of Roseburg, Ore. The club also decided to place mileposts and signs at convenient points on the county roads. A committee was also appointed to draft an ordinance for the regulation of vehicle traffic in Roseburg and present it to the council for action. The following officers were elected: A. Salzman, president; O. C. Baker, vice-president; J. W. Perkins, secretary; W. H. Fisher, treasurer.

Roosevelt Dam on Motor Route—Roosevelt dam, Arizona, in the little valley between the Superstition and Salt river mountains, now is famous because of the great dam irrigation project. It is readily accessible to motorists. In fact it is upon the transcontinental highway laid out by A. L. Westgard in a Premier. Westgard's Premier route approaches the dam from Santa Fe and Albuquerque, and the distance from the latter, which is the largest city in the state, is 521 miles. The country is wonderfully grand in scenery and the Premier pathfinder was the first motor car ever to cross through the beautiful Romances, where the sandy road winds between the malapaj rocks and the sandstone cliffs. The route crosses the White moun-

tains at an altitude of 9,740 feet, goes through the Apache Indian country and a United States forest reserve. Roosevelt dam is about 90 miles from Phoenix.

Booming Chicago Motor Club—The team membership contest of the Chicago Motor Club is on this week and there is every indication that the five teams contesting will bring in 300 new names, which will give the club 1,000 members. The recruiting is not confined to Chicago alone. Dr. H. A. Gunther secured several new members at the Quincy show last week.

After a June Meet—It is reported that the Milwaukee Automobile Dealers' Association is considering a June race meet at Wisconsin state fair park. The board already has decided to make Saturday, September 9, the last day of the 1911 state fair, motor day, with a big race meet in the afternoon. A fall show will be held in the new Machinery hall during the fair. Francis A. Cannon, secretary of the Citizens' Business League of Milwaukee, and member of the board, is in charge of these events.

Primo to Scout Extension—The national highway from New York city to Atlanta, Ga., is to be extended from the latter city to Jacksonville, Fla., and three varying routes are to be traversed in order to select the best to be used by the tourists from New York to Florida's metropolis this year. The Atlanta Journal and New York Herald are the fathers of this good roads movement, and have selected a Primo car for a pathfinder. The routes between the two southern cities embrace every class and kind of good, bad and indifferent roads, but after the selection of the official

route, the various counties have promised extensive road improvements and the tourists will have easy sailing.

Preparing for the Tourists.—The Automobile Club of Syracuse, Syracuse, N. Y., anticipates the busiest season that has been experienced there in the number of touring parties passing through. The work of erecting signs will begin as soon as the roads are passable. The club has 100 signs on hand and specifications for 200 more to be erected this year. The route of last summer's Watson cup run, to Sherburne and return, is to be posted thoroughly this year, as this is one of the most popular one-day runs in the state. The route of the Herald sociability run, to Auburn, up Owaseo lake and across to Skaneateles lake and return, also is to be well posted. While arrangements are not made, the club's annual banquet will probably be held about April 10. The route is not yet decided.

Toll Bridge for Motorists.—The secretary of state has issued a charter to the Lexington Auto Bridge Co., of Lexington, Okla., capital \$25,000. This corporation will build a toll bridge across the Canadian river from Lexington to Purcell. This river is a turbulent stream and during rainfall it is impossible to ford it. As these two towns are on the main highway running from Oklahoma City to Texas, the building of this bridge will make the highway passable at all times, regardless of freshets. The incorporators of the company are well known capitalists who are motorists, being J. A. Brownell, L. J. Brownell and A. Brownell, all of Lexington, Okla.

Big Increase in Minnesota.—The number of cars in the state of Minnesota will increase from 7,000 in 1909 to nearly 20,000 in the present year, according to a prophecy by Julius H. Schmahl, secretary of state. The number of tags already sold this year is over 7,000. At the present rate the total for the current year will reach 16,000 at least, and possibly 20,000. Among the 7,000 issued so far is one for the governor, No. 6999. The government has lost out in the shipping of the tags, for the express companies have agreed to take the trade at a flat rate of 3 cents less than the government postage rate. The postage rate is 18 cents and the express rate will be only 15 cents.

Has 1,000 Members.—The 1,000-membership mark of the Automobile Club of Cincinnati was reached March 22 when Charles Garber, of Hyde Park, Cincinnati, became a member. The Automobile Club of Cincinnati now is the largest and most influential club in the state of Ohio. The club is actively engaged in bringing about better conditions of roads and highways, and has expended more than \$2,000 in erecting road signs. The chairman of the law committee, Harry L. Gordon, has prepared a bill requiring all vehicles to display lights at night, and the legislative committee is now endeavoring to defeat a bill raising the state license fee to \$10,

\$15 and \$20, according to the horsepower of the car. Headquarters are maintained in the Gibson house, and touring information is furnished free to all members. It is hoped to increase the membership during the coming year to 1,500.

Boosting at Washington.—The Automobile Club of Washington is making a strong effort to increase its membership. At the last meeting of the board of governors the applications of twenty-five new members were acted on favorably. It is planned to increase the membership to 500 within the next 6 months. The club's country home, which has been closed during the winter, will be opened April 15 with a smoker.

Omaha After Members.—The Omaha Motor Club is starting an energetic campaign to increase its membership. With this accomplished, it is planned to start out into the state and try to organize a club in every town of any size in Nebraska. The Omaha club is the only one in Nebraska that belongs to the A. A. A. However, at its call, a meeting of various representatives of clubs in the state assembled in Omaha during the show to form a state association, with the idea of eventually joining the A. A. A. Only three clubs definitely joined at that time, but others have expressed their intention of coming in. The Omaha club is anxious to

get a big state organization, however, so that a still greater interest in good roads can be stirred up, and better highways through the state secured. Men out soliciting membership raised the club rolls 25 per cent in 2 weeks. There are now about 250 members and it is hoped to make it a thousand in the near future.

Inspecting Signboards.—The Chicago Motor Club proposes to thoroughly inspect its 700 miles of signboards this spring with the idea of repainting them and replacing any that have been knocked down. Charles M. Hayes, chairman of the signboards committee, made the first trip Sunday in a Halladay, going out on the South Bend route. He found only one sign missing.

More Time to Enter.—After considering the request of several manufacturers who were unable to complete their racing cars in time to take advantage of the \$500 entry fee for the 500-mile international sweepstakes race to be held on the Indianapolis motor speedway next Memorial Day, which was increased to \$750 per car March 1, the speedway management has decided to reopen the entry list at the lower fee of \$500 for a period of 10 days from March 20 to April 1. The fee will be increased to \$750 again April 1, and will not be reopened at the lower figure again.



ONE VIEW OF THE SANTA FE TRAIL, SHOWING PREMIER DESCENDING HILL IN PICTURESQUE SECTION

Many Wonders of Autogenous Welding

Oxy-Acetylene Process Is Illustrated—Acetylene Gas Burned With Pure Oxygen Gives a Flame Temperature of 6300 Degrees and Is Useful in Motor Car Repairing

By Henry Cave

AUTOGENOUS welding is the uniting of metals into one solid mass by fusion without the intervention of a different metal. The pronunciation of the word is aw-todg-e-nus, not auto-genous, as nine-tenths of the people seem to wish to call it. The definition of the word is auto, meaning self; and genous, meaning generated, self-generated or self-produced, meaning that the weld is produced by merely liquifying the parts and allowing them to run together.

There are several types of autogenous welding, the one we are going to demonstrate tonight being carried out by means of the oxy-acetylene flame, that is, acetylene gas burned with pure oxygen, which gives a flame temperature of 6300 degrees. The foundryman's burn is really autogenous welding, he using a large mass of molten metal poured over the piece to bring it to a liquid state, and when this point is reached the pouring stops and the metal remaining in the mold forms part of the piece to be welded. There is a type of electric welding called arc welding, which is autogenous, the electric arc being used to fuse the parts together. The ordinary form of electric welding is not autogenous, as pressure is required to force the parts together. The ordinary blacksmith's form of welding is not autogenous, as the parts are merely brought to a plastic condition and hammered together. Brazing and soldering are not autogenous, as a different material of a lower fusibility than the parts to be welded is used to run in between the parts on which the work is being carried out. Thermit welding might be termed partly autogenous, as the metal used might be of the same nature as the part being welded, and it is merely used to raise the temperature to the melting point similar to the foundryman's burn.

The first inception of the oxy-acetylene process was in 1895 in France. It seems to be the case that the majority of the developments and inventions that originate in the laboratory and scientific end come from abroad, the great inventions of this country apparently being developed from a practical end and the theory worked out afterward.

First Inception of Process

The oxy-acetylene process was first thought of by Le Chetelier, who figured out that by burning acetylene with pure oxygen a temperature of 6300 degrees

could be obtained. You will note that this was immediately after the commercial development of calcium carbide to produce acetylene at a reasonable price. It was not, however, until 1901 that the process could be used, owing to the practical considerations of making a satisfactory torch. You can realize the difficulty of uniting oxygen and acetylene in a torch, and keeping the flame burning on the outside, they having the tendency to ignite at the point where they first come together. This at first was prevented by the use of hydrocarbon gas along with the acetylene. In 1903, however, developments had been worked out which did away with this necessity and a really practical torch was placed on the market in France. It was not until 1906, however, that an equipment was brought into this country for actual manufacturing purposes, though a torch came into this country in 1904 and was used experimentally. From that time, however, there has been rapid development in both the equipment, the uses for the process and the method for carrying out the work.

Idea on Temperature

A good idea of the temperature 6300 degrees is obtained from the fact that, if a thermometer had a scale 8 inches long between freezing and boiling, it would require to be about 21 feet long to measure the temperature of this flame on the same scale, the 6,300 degrees is of course Fahrenheit. The method of using this flame is to merely melt the parts together, which could be termed recasting locally. Where a part has considerable thickness, it is necessary to remove the metal so as to form a groove. The flame is then applied to the feather edge at the bottom, and this is fused together, metal being added and fused to the walls of the groove until it is entirely filled up, and if necessary additional metal can be built on, so as to increase the strength and dimensions far beyond what it was before; of course, metal can be built on though there be no break to repair, so that parts can be strengthened before they break or metal removed by accident in mistake may be replaced, defective materials and workmanship being corrected. All metals can be welded in this manner.

The reason why a temperature of 6,300 degrees is necessary, when the ordinary metals melt at not over 2,500 degrees, is due to the conductivity of the metal; one would think that the oxy-hydrogen flame which has a temperature of between 4,000 and 4,500 degrees would be sufficient to carry out this work, or even the ordinary illuminating gas and air flame used in a blowpipe, as these flames have sufficiently high temperature to fuse the metal. The



ILLUSTRATING THE FIELD OF AUTOGENOUS WELDING. IN THE UPPER ILLUSTRATION IS SHOWN A BROKEN CYLINDER CASTING IN WHICH BOTH WATERJACKET WALLS ARE FRACTURED. IN THE LOWER ILLUSTRATION IS SEEN THE SAME CASTING AFTER BEING REPAIRED BY THE AUTOGENOUS PROCESS, WHICH IS DISCUSSED BY MR. CAVE

conductivity, however, is so great that the heat is drawn away from the point where the flame is supplied into the body of the metal nearly as rapidly as the heat is applied by the lower temperature flame, with the result that a large mass of metal is brought to a red heat instead of merely at the point where the weld is required, with the result that the part is warped out of shape or scaled so as to make it useless. With the oxy-acetylene flame, however, the heat is put into the metal so rapidly that the conductivity had not time to draw it away, with the result that metal begins to fuse when the surrounding parts 2 or 3 inches away are cool enough to touch, and before any large amount of surface is brought into action to radiate the heat. The metals of higher conductivity of course require a larger flame, and a greater area is heated up.

Cost of Welding

The cost of the process varies in direct proportion to the mass of metal that has to be heated up, and therefore not necessarily in accordance with the sectional area of the welds. The only reason why this high temperature is required is on account of the concentration of the heat, and therefore the rapid penetration at that

Described By Expert Metallurgist

Editor's Note—This paper on autogenous welding was read by Mr. Cave before the Mechanical Engineering Society of the Massachusetts Institute of Technology.



THE FIELD OF AUTOGENOUS WELDING IS DEMONSTRATED IN THESE ILLUSTRATIONS IN THAT THE UPPER ONE SHOWS A PIECE BROKEN OUT OF THE LOWER END OF A CYLINDER FOR A GASOLINE MOTOR AND IN THE LOWER ILLUSTRATION IS SHOWN HOW THE PIECE IS IN POSITION AND FUSED INTEGRALLY WITH THE CYLINDER ITSELF

point. It can be readily seen that where a weld has to penetrate any depth, the flame being applied to the surface will melt the metal at that point, and a continuation of the application of the flame will merely burn that metal away, and not until then will the metal below the surface be fused; it is therefore useless to try to make a lap weld or one of any depth, the before described method of grooving out the parts being necessary where welds of any thickness are to be made. The reason why the oxy-acetylene flame gives a temperature of 6,300 degrees is due to the fact that acetylene is composed of 92.8 per cent of carbon and the balance hydrogen. This large amount of carbon requires a large amount of oxygen for complete combustion, and when acetylene is burning in air, insufficient oxygen cannot be obtained for complete combustion from the one-fifth approximately of oxygen which is contained in the air; the result is the gas has to spread out through a considerable space to obtain the necessary oxygen, and therefore the temperature is brought very low, acetylene burning in air merely giving a temperature of about 1,800 degrees, whereas illuminating gas is

in the neighborhood of 2,500 degrees. It will be noted when the acetylene is turned on the torch and ignited, the flame has a considerable length and is very smoky; when the oxygen is turned on this flame shortens up to about $\frac{3}{8}$ inch in length, the heat being concentrated into that space, and you can readily realize the large increase of temperature thus produced by the process.

Heat is Lost

Another thing that has largely to do with the high temperature is that the four-fifths of nitrogen in the air, which flames burning with air heat up to a considerable degree, such heat being lost, is eliminated where pure oxygen is used. It will be noted when the oxygen is turned on the torch that there are two distinct flames, one the short flame $\frac{3}{8}$ inch long being very bright in color, and the other one, which spreads out, being not very noticeable; this is due to the fact that hydrogen and oxygen together form water, and therefore cannot unite above the dissociation point of water, the temperature of the carbon of the acetylene burning with pure oxygen being very much above this point, the hydrogen is compelled to pass through this hot flame and uniting with the atmospheric oxygen, burns with this extended flame, it being termed the envelope. This has two distinct advantages, one being that it keeps the nitrogen of the air from coming in contact with the hot carbon flame and therefore cooling it. It also keeps the oxygen in the air from coming in contact with the weld and oxydizing it.

The peculiar feature of this equipment consists of a cylinder of dissolved acetylene and a cylinder of oxygen, the necessary reducing valves, hose connections to the torch, the torch itself and the tips wherein the mixture is produced, and at the end of which the flame burns. The dissolved acetylene cylinder being used for portable work, whereas the Davis high-pressure generator is used for stationary work, the acetylene being produced from calcium carbide, the peculiar feature spoken of is the fact that it is possible to obtain the material from which a flame 6,300 degrees of temperature can burn, that material of the tip is merely common brass, the flame does not actually touch the brass, it being projected an infinitesimal distance away due to the pressure of the gases, and what small amount of heat is radiated back into the tip is carried off by the cool gases passing through.

Tip to Reduce Temperature

The process would be absolutely inoperative if it were necessary to have a tip

Lecturer Declares Millions of Dollars' Worth of Broken Parts of Machinery Is Thrown Away Which Could Be Repaired Easily By This Process If It Were Usually Understood

to resist the temperature of the flame, as so far we have not come across any material which will do that.

The process of welding we are demonstrating tonight is termed the Davis-Bournonville high-pressure positive mixture equipment; the high-pressure spoken of is merely the fact that the acetylene is under an appreciable pressure not exceeding 15 pounds, as well as the oxygen. This is taken advantage of in getting a thorough homogeneous mixture of the gases, the gases striking together at right angles in the tip; both under pressure get a very close molecular contact, and passing down the passage in the tip to the outer air, are there ignited and burned. This type of tip uses only 1.28 of oxygen to each unit of acetylene consumed. There are other types of torches on the market, called low-pressure injector mixture—these use from 1.5 to 1.8 of oxygen to each unit of acetylene, due to the fact that the acetylene being brought in under no appreciable pressure, is drawn into the mixture by the injector action of the oxygen, thus producing a stratified mixture, which not only causes a loss of economy, but also largely affects the strength of the weld, due to the surplus oxygen oxydizing the material. It can also readily be seen that where acetylene is brought in by injector action, the mixture cannot be very closely regulated, whereas in the high-pressure positive mixture type, the gases are regulated by the size of orifices through which they have to pass, both being regulated in this manner. This process can readily be realized.

Considerable Waste

At the present time there are millions of dollars' worth of broken parts of machinery being thrown away which could be taken care of in this manner if those in charge had a knowledge of the possibilities of this process. It is possible to save not only considerable on the value of the part, but also large sums of money, due to the reduction in time required to obtain a new part, which is often of very much more importance than the saving of the part itself. The saving to be made by this means is well illustrated by the welding of a broken car frame as compared with other methods of repair. A motor car frame can be welded in a few hours at comparatively small cost, but by other methods it is necessary to strip down the car and either replace the side member with a new one or put in a flash-

plate, riveting it up; it is then necessary to reassemble the car, test it out with the possibility that adjustments have been disturbed which materially affect the correct running of the car, this process generally taking about 6 days, and it can be seen that in the case of a commercial vehicle that the time thus expended is a very serious loss, in addition to the extra cost of carrying out the work.

The process is being extensively used by street railway companies for the repair of broken motor cases and also for filling in the concave joints of the tracks produced by the hammer of the wheels at the joints. The extent to which the welding of cast iron can be carried out is well illustrated by the welding of motor car cylinders, in which the crown of the combustion chamber has been broken out. It is necessary to remove the section of the waterjacket so as to weld the break from the outside; this section is then welded back in place, and if the parts are not available to replace, a piece of sheet steel can be formed up to fit the cylinder and can be welded in place, the repair not being distinguishable after it has been cleaned off. This might be termed tracheotomy.

Welding Metals

It is possible to weld metals so when they are machined off, the weld is indistinguishable. Broken gear teeth can be filled in with new metal, and the part recut with the expensive cutters, the metal being perfectly soft and there being no fear of injuring the cutter if the work is properly carried out, the tooth being in every way as good as the one that was broken out. We have welded in teeth of a gear, 22-inch face, $6\frac{1}{2}$ -inch pitch, 15 feet in diameter, weighing 16 tons, and in case of a tooth of this size or even considerably smaller, the metal can be built up on the tooth, it not being necessary to fill in the space, as is the case with the smaller pitch.

The process can also be extensively used in manufacture along certain lines. The use is obvious for correcting errors in workmanship or design, or defective material such as blow holes and cold laps, and there is a large amount of work to be carried out in welding up pressed steel parts. This is an age of pressed steel, but in the past there has been limits to its use, owing to the difficulty of fastening pressed steel parts together, due to their thinness, by welding them. However, a great number of parts which are now made of casting can be made of pressed steel with great advantage both as to cost and efficiency.

Cutting Metal With Oxygen

Another extensive use for this process is its cutting steel and wrought iron by a jet of oxygen. It is not possible to cut cast iron by this means, owing to the free carbon in its position. This process is really a development of the laboratory experiments of making a jar of oxygen,

The Motorists' Bookman

Old English Inns

FROM the earliest times inns have been closely linked with England and her historical and literary associations, and those desiring to trace the history of these quaint old inns of England, which now are fast disappearing, will find "Old Country Inns of England," by Henry P. Maskell and Edward W. Gregory, a pleasant and educational study.

The book begins with a description of the manorial inns; following which are chapters on the monastic inns, the hospices, the coaching inns, the wayside inns and alehouses, the church inns, the inns of literature and art; the book defining the different types of inns as being the outgrowth of the social and political needs of the time. The monastic inns were made use of in preference to the manorial by the rich because of their comfort and security, and by the poor because there was nothing to pay; during the era of the pilgrimages in England a special form of lodging house, called hospices, developed, this type being half inn and half charitable. Then there were the coaching inns with their romantic followings, some of which in out-of-the-way places are still standing, awaiting a new popularity from the patronage of visiting motorists.

The historic signs and signboards, inn furniture, the new inn and its possibilities, the innkeeper, and public house reform are

the subjects of several chapters. In closing the authors plead for the retention of these historic old inns, and also offer a few suggestions for the future of the inn, for, as stated in the preface of the book, "the public house as a national institution still has its purpose to fulfil and the few suggestions have been included with a view of showing how it might easily be adapted to modern social needs." The book is profusely illustrated with reproductions of photographs and pen-and-ink sketches by the authors. L. C. Page & Co. Boston. Price, \$3.

Garage Designs

"Garages and Motor Boat Houses," by William Phillips Comstock, is a 120-page volume giving designs and floor plans of garages suitable for a wide range of requirements. The illustrations are from garages built for car owners in different parts of the country, ranging in design from the 12 by 16 wooden structure for a runabout to the palatial structure for the millionaire. These designs cover private country and suburban garages, private city garages, also suburban and city public garages. The chapter on public garages features the one-story building, the two-story design, and the multi-floor construction found in the large cities. There is a chapter on equipment and appliances as well as on motor boat houses. The New York garage regulations are included. The William T. Comstock Co., New York.

heating an iron wire to a red heat and inserting it in the jar of oxygen, when it will begin to glow and scintillate and eventually be burned up. The oxy-acetylene flame is used to heat a spot of metal on which a jet of oxygen is projected from an additional supply; the oxygen combines with the red hot metal and oxidizes away, or the metal practically burning itself through at every point where the oxygen touches it. The stream of slag coming from the first section cut passing over the surface lower down keeps that up to the point where the oxygen will combine with it, and that in turn is consumed, the action being progressive. This is used for such purposes as cutting irregular shapes which cannot be cut satisfactorily by means of up-to-date labor saving tools, such as cutting down structural iron-work in position, cutting out dies, wrecking buildings of all descriptions. You remember the pier 14 on the North river, New York, being burned down a few months ago; there were over a thousand tons of twisted metal which the contractors undertook to remove in 30 days. Owing to labor conditions they could not get sufficient men to remove the parts by ordinary means inside of 6 weeks, and

they were under a penalty of \$300 a day over the 30 days. They purchased a cutting equipment, and with eighteen men removed this metal in 20 days, as compared with the requirement of thirty-five men for 6 or 8 weeks, by other means, the saving thus produced being ten or fifteen times the cost of the plant.

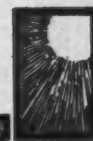
Example of Utility

In the west a large steel construction building was burned down, the floors falling on one another and imprisoning bodies in the basement. It would have been necessary to have worked at this for a month or more before the bodies could have been recovered by other means, but by use of the oxy-acetylene cutting torch the bodies were recovered within a few days.

The heat from the oxy-acetylene flame can be used for a number of purposes other than welding and cutting, such as making short heads either to straighten parts or to bend them. It can also be used for hardening parts locally, being of great advantage in the hardening of such parts as one piece cam shafts for automobiles, the heat not penetrating sufficient to cause trouble with the straightening of the shaft after the hardening.



Development Briefs



THE Pitless Auto Turntable Co., Kansas City, Mo., manufactures a turntable which rests directly on the garage floor and does not require a pit, excavation or any alteration of the floor. The runways on which the car wheels travel are steel, 15 inches wide, with a 3-inch flange on each side. These runways are bent downwards at the end to allow of the car running up on them. The framework of the turntable is a skeleton steel work carried on eight castors, which run on an 8-pound steel track. This track is of T cross section, which track is solid enough to bridge any floor defects. In the center of the turntable is a king pin, from which radiates six stay rods to maintain the circular track in position. These stay rods eliminate the necessity of any floor fastening. The center plate carrying the king pin does not rest on the floor, but is supported by a combination thrust ball bearing.

The company manufactures two types of these turntables, one known as the portable, the other the stationary; both are alike in principle but differ in runway approaches. In the portable type these approaches end in fixed lips, sloped to operate within half an inch of the floor, whereas the stationary type does not have these fixed runways but, instead, has the runway ends shaped to register in circular radius with concrete approaches provided on the garage floor. These turntables may be provided with a small electric motor for operating them.

The Mea Magneto

The Mea magneto, made by the Mea company, of Stuttgart, Ger., and marketed by Marburg Brothers, of New York city, is a high-tension magneto requiring no step-up

Brief and Concise Descriptions of Motoring Necessaries



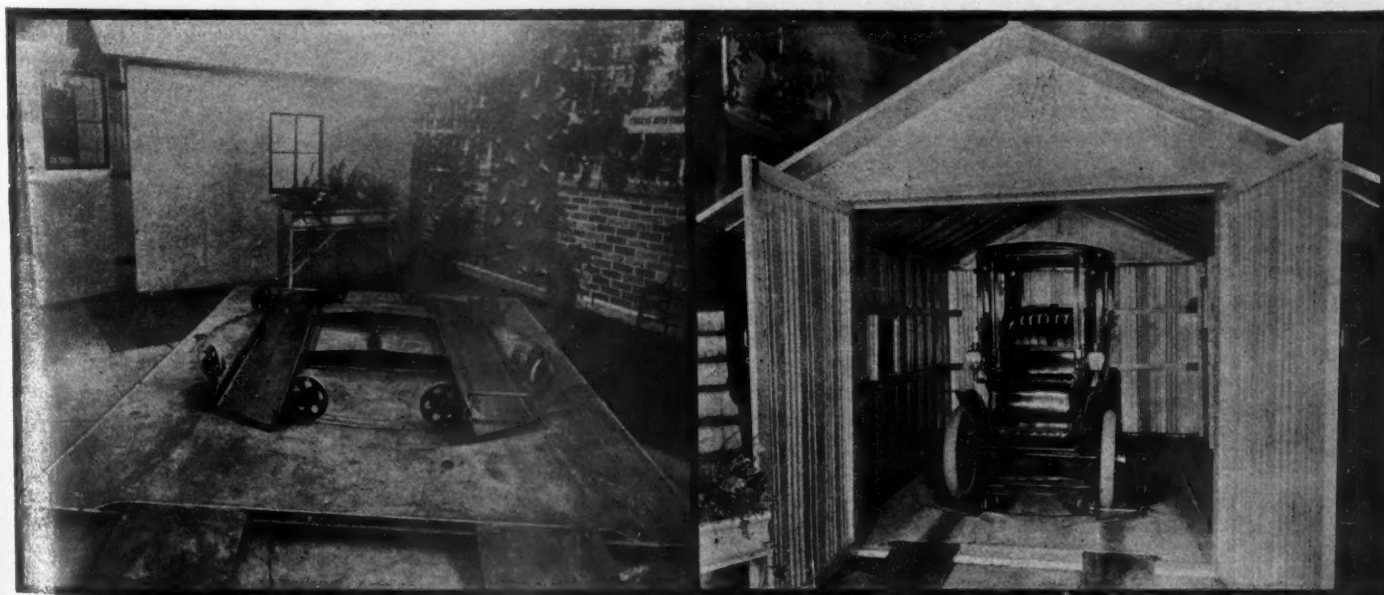
THE WESTINGHOUSE POLISHER

coils. It has bell-shaped magnets placed horizontally instead of the customary horseshoe type. This is a radical departure which makes practicable the simultaneous advance and retard of magnets and timer, so that the spark is always generated in

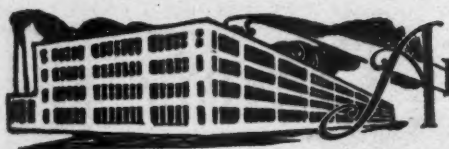
the strongest part of the field. This is the most characteristic and advantageous feature of the mechanism, its large range of timing, for as the magnets and timer are shifted together, the heat value of the spark is the same in the advance and retard positions and the range of timing is limited only to the amount the motor can stand. The magneto proper is mounted on a cradle, which is bolted to the motor frame and remains undisturbed when the magneto is dismounted. Resetting or re-timing is made easy by means of a small indicator which shows the number of the cylinder that the instrument is ready to fire. The circuit breaker is of a new design which opens parallel to the axis of the armature instead of radially, so that it is unaffected by centrifugal force and less spring tension, therefore, is required. Thus, consequent hammering and wear of the contact points is reduced. In addition to this the moving parts of the breaker are extremely light. A floating roller and a hardened cam are used in the breaker device, and no oil is required in any part of the breaker box.

Westinghouse Electric Polisher

The Westinghouse electric polisher is for polishing the brass work and other parts on motor cars. The polishing part is a rotating disk or brush driven by a small electric motor of 1/20 horsepower. This motor can be operated from a 115 or 230-volt direct-current circuit, or 110 and 220-volt alternating circuit. The whole device is specially light, the motor being suitable and can be carried in the left hand and the polisher held in the right hand. The Westinghouse Electric & Mfg. Co., Pittsburg, Pa.



TWO VIEWS OF PITLESS TURNTABLES—AT THE LEFT IS SHOWN A DESIGN SUITABLE FOR ANY GARAGE AND AT THE RIGHT IS THE STATIONARY TYPE IN A PORTABLE GARAGE



Among the Makers and Dealers



WHERE THE MARMON IS SOLD BY URWICK MOTOR CAR CO. AT LOUISVILLE

ENGINEERS Get Busy—New York members of the Society of Automobile Engineers propose to hold frequent meetings. Other cities are urged to follow suit.

Fisk Branch in Milwaukee—The Fisk Rubber Co. is the latest tire manufacturer to establish a branch in Milwaukee. The Diamond Rubber Co., Firestone Tire and Rubber Co., and United States Tire Co. have recently opened branches, supplanting local agencies.

Sale in Ontario—It is always a matter of great interest to know how many cars are sold each year in the province of Ontario, which is the motor car center of Canada. During the year 1909 1,265 were disposed of in the old province; in 1910 1,893 cars were sold, an increase of 78 per cent.

Canadian Reorganization—At a reorganization meeting of the new Dominion Motor Co., of Windsor, Ont., incorporated with a capital of \$100,000 to take over the assets of the Dominion Motors Limited, S. A. Griggs of Walkerville was elected president, Enoch Smith, Detroit, vice-president, and Horace Peabody Windsor, secretary-treasurer.

Quakers at E-M-F Lecture—Prominent officials of the company and dealers and agents of the E-M-F and the Flanders from the district embracing eastern Pennsylvania, southern New Jersey, Delaware and Maryland assembled in convention at the Hotel Walton, Philadelphia, on Tuesday, the gathering amounting to about 100 men. Instructions to agents and the advantages of the E-M-F company's economical methods of manufacture were pointed out in addresses and moving pictures, the latter demonstrating the various stages of construction of the E-M-F and Flanders cars. Preceding the pictures, a dinner was given. The convention was part of the campaign

of education instituted by the company, a series of which are to be held in various cities of the country.

Fire at Richmond, Va.—Fire of unknown origin partially destroyed the shops of the Virginian Auto Co. at Richmond, Va. The fire was confined to a paint shop, where there were several unfinished cars. The loss is estimated at more than \$10,000.

Rebuilding Shops—The Mitchell-Lewis Motor Co. already is rebuilding the assembling shops at Racine, Wis., partly wrecked by an explosion in japanning tanks and ovens last week. Frank McNear, superintendent of the department, was killed by the explosion and a loss of \$30,000 resulted.

Time Extended—Under a ruling of the secretary of the treasury the regulations issued June 20, 1902, March 15, 1905, and article 595 of the customs regulations of 1908, regarding the free entry of motor cars of foreign manufacture imported into this country by the owners for bona fide touring purposes, under bond for a period of 3 months, shall be amended so as to extend the period during which such motor cars may remain in this country to 6 months.

Montreal Trade Organizes—An informal meeting was held in Montreal recently, when car dealers and allied trades got together for the purpose of forming an association. It was pointed out that frequent meetings among the fraternity would engender a good spirit of co-operation in furthering the interests of the trade and in urging the agitation of good roads. It was decided that the body would be known as the Montreal Motor Trade Association, and the following officers were chosen: F. G. Pennal, of the Canada Cycle Motor Co., Ltd., president; W. P. Kearney, of the Rubber Tire Wheel Agency Co., vice-president; M. E. Redpath, of the Motor Import

Co. of Canada, second vice-president, and Arthur J. Lee, of the Canadian Automobile Co., secretary-treasurer.

Plant Destroyed—The plant of the Ideal Motor Co., at Lansing, Mich., was destroyed by fire March 20, with a loss of approximately \$150,000. The fire started in the testing room and is believed to have been caused by a spark from an emery wheel falling into a pan containing a mixture of water and gasoline.

Buys Steel Wheel Plant—Joseph Zeigler, one of the stockholders, has bought in at receiver's sale the plant of the American Steel Wheel Co. at Alexandria, Ind., for \$24,249.44. The company was organized about 2 years ago and about \$200,000 was invested. Stockholders could not agree, however, as to how the company should be operated and the factory buildings were nailed up and permitted to remain idle. Mr. Zeigler brought the suit resulting in a receiver being appointed on an indebtedness of \$20,000 due him.

Moving to Port Huron—At the annual meeting of the Cass Motor Truck Co., the headquarters of the company were changed from Detroit to Port Huron, and the following directors were elected: H. G. Barnum, Frank J. Haynes, Phil Higer, Oscar Baer and P. H. Phillips, of Port Huron, and John L. Turnbull, George E. Epstean, Alex. Spater and Franklin V. Nickola, the last named four of Detroit. The directors elected Frank J. Haynes, president, and Oscar Baer, vice-president.

Starts First Unit—The Four Wheel Drive Auto Co., Clintonville, Wis., last week awarded the contract for the erection of the first unit of the proposed \$75,000 plant to B. Herman & Son, contractors, Antigo, Wis. Work has already been started and the building will be completed in 90 days. The orders on hand are sufficient to keep the company busy at normal capacity for 12 months. The present plant in the former Zachow & Besserlich machine shops at Clintonville is running overtime.

Addition to Indianapolis Row—Motor row in Indianapolis, upon which approximately \$1,000,000 already has been spent, is to be still further extended by the addition of two more buildings. These will be two-story reinforced concrete structures, equipped with all modern conveniences for garages and salesrooms. One will be 45 by 150 feet and the other 60 by 150 feet. The J. I. Case company, of Racine, Wis., maker of Case cars, and the American Motors Co., maker of the American, have recently established factory sales branches in the row. The new improvements will cost about \$100,000. Ultimately the row will occupy two full

squares along the west side of the Capitol avenue boulevard from Vermont to North streets.

Blue Ribbon for Lozier—Word has just been received from Porto Rico that the display of Lozier cars was awarded first premium in the insular fair held at San Juan.

Chassis for Ladder Truck—The Couple Gear Freight Wheel Co., of Grand Rapids, Mich., has shipped a massive chassis to be used as a ladder truck in the New York city fire department. The truck is built to carry 55-foot ladders and has a weight of 8 tons.

Will Make a Motorette—The Motorette Co., of Columbia, Ohio, will introduce a new car in the near future. The Motorette is of the three-wheel type, having the advantage of changing from a pleasure to a commercial car. The operation only necessitates a few moments' time. The car has a two-cylinder double-opposed motor, developing 10 horsepower; planetary transmission and a single wheel on the rear of the car.

In New Offices—The United States Tire Co. is now firmly established in its new headquarters at Fifty-eighth street and Broadway, New York, and some idea of the volume of business transacted in the general offices of this big concern may be gained from the number of employes regularly engaged in looking after the details of the various departments. The aggregate is more than 300 and they are distributed over three floors of the American building.

Activity at Peoria—During the past year the motor business in Peoria, Ill., has gone through one of the biggest changes in the history of the business in any city of the United States. Garages have sprung up during the past year on almost every street of the city. During the past winter several new garages have been opened, the M. N. Baker & Co. garage on upper Main street, the R. E. Lawrence new garage and show room a few blocks above them, the Crown Auto Co. and the Cadillac Co. have been thrown open to the public. The estimated cost of the new buildings for use

as garages and showrooms during the past 6 months reaches well toward the half-million mark.

Building an Addition—The Sprague Umbrella Co., of Norwalk, Ohio, is building an addition to its factory. It now is working a large night force and is turning out 100 shields a day.

Alco Chief Engineer Resigns—It is officially announced that B. D. Gray, chief engineer of the American Locomotive Co., Providence, R. I., builder of the Alco car, has resigned, the same to take effect April 1. Mr. Gray is one of the oldest members of the Society of Automobile Engineers, having occupied positions of prominence in the society.

Bought by Prest-O-Lite—The R. H. Combs Motor Equipment Co., of St. Louis, has been purchased by the Prest-O-Lite Co., of Indianapolis. R. H. Combs, who has represented the Indianapolis concern in St. Louis for a number of years, will manage the branch. The Macnich Electric and Supply Co., which has occupied part of the building with Combs, will remain under the new order of things.

May Move to Logansport—The Star Automobile Co., of Indianapolis, is negotiating with business men of Logansport to remove to the latter city. The proposition is that a bonus of \$75,000 shall be given and about \$25,000 has already been raised. Although the company never has actively engaged in the manufacture of cars, it has built two machines, known as the Star, for testing. The company was organized about 1 year ago.

Whitney Plant in Hartford—The plant of the Whitney Mfg. Co. is at Hartford, Conn. A single-story building and a new five-story addition to the main factory were completed during the year 1910. The five-story addition gives an additional floor space of 24,000 square feet. The main factory and the connecting building on the right are of reinforced concrete construction. The plant is on the main line of the railroad from New York to Boston, and the company has its private sidetrack and 11 acres of property. A small park at the

right of the office entrance is being fitted up for the use of employes at the noon hour during the summer months.

Simplex Branch Opened—The Simplex Automobile Co. this week opened a Chicago branch at 1330 Michigan avenue, with James K. Christie in charge.

New Kind of Tire—Nels Johnson, of Racine, Wis., has invented a new type of puncture-proof tire. The inner tube is filled with a composition in liquid form which closes any hole or break that might be made by a nail or glass.

Hood with Everitt—The Metzger Motor Car Co. announces the appointment of Wallace C. Hood as sales manager, Mr. Hood resigning as western sales manager of Chalmers Motor Co. to accept this position. He has been connected with the industry for 12 years, the greater portion of which has been spent in the selling end of the business.

Ford's February Output—During the month of February the Ford Motor Co. turned out 3,600 cars, the value of each day's output being \$100,000. Each week end the Ford company had an order in with the Michigan Central, one of a number of roads used, for 200 box cars. The output of the Ford factory for 1911 will be 30,000 cars, it is announced.

Shipping From Haynes Factory—Twenty-four days after the fire, the Haynes company begun the regular daily shipment of Haynes cars from its factory. The company now has all departments lined up in quite a satisfactory manner and production is going forward in even a better manner than it has anticipated, and shipments will be delayed considerably less than the company had figured on at first.

Abbott Company Included—The treasury department has ruled that the regulations of March 22, 1907, providing for the allowance of drawback on the exportation of motor cars manufactured by the Pope Motor Car Co., with the use of imported ball bearings and magnetos, shall be extended to cover the exportation of cars manufactured by the Abbott Motor Co., with the use of Bosch magnetos.



PLANT OF THE WHITNEY MFG. CO. AT HARTFORD, CONN., SHOWING ADDITIONS



Brief Business Announcements

GREENSBURG, PA.—The Rose Brothers Automobile Co. has opened its garage on Maple avenue.

Toledo, O.—R. W. Kumler has opened up sales rooms at 235 Erie street, where he will handle the product of the Standard tire protector.

Portland, Ore.—The Menzies-DuBois Automobile Co. will shortly house its Franklin line of cars in a garage which will be built at Nineteenth and Couch streets.

Mishawaka, Ind.—The Mitchell agency, which is in charge of George Eberhart, has opened a large garage and machine shop. The building in which the garage is located is 50 by 48 feet in size.

Eau Claire, Wis.—G. H. Field, of Rice Lake, Wis., and W. M. Edwards, of Eau Claire, Wis., have formed a partnership and will distribute the Hupp and Overland lines, with headquarters at Eau Claire.

Philadelphia, Pa.—The Automobile Supply Co., 1331 Vine street, has removed to more commodious quarters at 225 North Broad street. The company deals in everything pertaining to electric, gasoline and steam cars.

Wilmington, Del.—The Wilmington Motor Service Co. is making preparation to inaugurate a passenger and freight taxicab service in Wilmington. The company has opened offices in the Ford building, at Tenth and Market streets. The T. C. Bradford Co. is now operating a similar service.

Chippewa Falls, Wis.—The Chippewa Auto Tire Co. has leased the Vincent building and will deal exclusively in tires and repairs. John M. Garver, of Decatur, Ill., formerly head of the Decatur Auto Tire Co., has been appointed general manager at Chippewa Falls. A steam vulcanizing plant is being installed.

Columbus, O.—The Stoneman Hardware Co., of Chagrin Falls, Ohio, has been incorporated with an authorized capital of \$25,000 to deal in motor cars and accessories, as well as hardware. The incorporators are John W. Stoneman, Philo I. Bailey, Irving G. Stoneman, Richard W. Stoneman and Thomas C. Hooper.

Toledo, O.—Plans have been completed for the incorporation of the Ray-Kuhn Co., with a capital stock of \$25,000. The new company will take over the accessory business of the W. G. Nagle Co. The business will be removed from its present quarters to 812-814 Madison avenue. J. P. Ray, of Grand Rapids, Mich., will be president and general manager of the business. W. G. Kuhn, formerly with the Nagle company, will be secretary and sales manager, and Herman Whitker will have charge of city sales. The firm will do a jobbing business

covering Ohio, Indiana and Michigan, as well as a local retail business.

Devils Lake, N. D.—The Ramsey County Auto Co., owned by the LaRue Brothers, has opened here.

New York—Harold Hyde, advertising manager of the Bosch Magneto Co. for the past 2 years, has severed his connection with that concern.

Streator, Ill.—C. J. Gurney, the Interstate agent, has purchased a two-story brick building, 75 by 150, and is now remodeling it to be used for garage purposes.

Chicago—Fiat agencies have been placed with the E. J. Thompson Co., of Pittsburg; the Electric Carriage and Battery Co., of Minneapolis, and Franklin Nichols, of Kansas City, Mo.

Seattle, Wash.—The Washington Motor Co., of which A. McLeish is president, J. Archie Hess, manager, and Fred Cavanaugh, treasurer, has purchased the Seattle Automobile Co.'s business at 1422 Broadway from H. P. Grant. The new firm has taken the northwest Washington agency for the Buick.

Salt Lake City, Utah—Harris M. Hanshue, the Apperson racing driver, has established headquarters at 45 State street for the sale of the Apperson and Reo cars. Mr. Hanshue comes here as the representative of Leon Shettler, of Los Angeles, who has been allotted the Utah territory for these cars.

Philadelphia, Pa.—The Foss-Hughes Co., distributor of the Pierce-Arrow cars, has removed from Broad and Race streets to the northeast corner of Twenty-first and Market streets. The new home of the Pierce-Arrow is a four-story building, containing more than 50,000 square feet. The commercial vehicle department of the new building will be an important feature, 12,

000 feet on the ground floor being devoted to this section.

Washington, D. C.—A new Firestone service depot has been opened in Washington, at 1736 Fourteenth street, N. W.

Edgerton, Wis.—Durner & Courtier have broken ground for a new garage 30 by 100 feet of concrete construction. It will contain a large repair shop.

Columbus, O.—Borroughs & Wolgamott, who have been operating a garage at 186 East Fourth avenue, have taken the central Ohio agency for the Norwalk.

Boston, Mass.—George Donahue, formerly with the Linscott Motor Co., has gone to New York to take charge of the New York selling branch of the McIntyre trucks.

New York—In order to secure the additional space which the growth of its solid tire business requires, the Swinehart Tire and Rubber Co., of New York, has moved to 1924 Broadway.

Wilkesburg, Pa.—J. P. Paufenburg, president of the Elmore Motor Car Co., Mals street, is moving his company from that location to a new garage at 729-731 Ross avenue, which measures 100 by 120 feet.

Boston, Mass.—J. E. Savell has taken the agency for the Lion and the Van cars in Boston, with salesrooms at 338 Newbury street. He formerly handled such cars as the Rainier and Parry and later became identified with the Motor Car Service Co.

Boston, Mass.—A new company has been formed to take over the business of the Percy Ford Co., which failed recently. It is called the Percy Ford Auto Supply Co. and the officers are: W. P. Cronin, president; J. S. Waddell, vice-president; V. J. Mulhern, treasurer; Percy Ford, manager. The building on Columbus ave-



NEW CARTERCAR AND PREMIER BUILDING IN SAN FRANCISCO

nut formerly used by the Fisk tire has been secured as salesrooms.

Boston, Mass.—Charles A. Andrews, manager of the Moon agency in the Hub, has added the Paige-Detroit to his line.

Somerset, Pa.—The Central Automobile Co. has been formed at Somerset by George P. Stein, D. B. Zimmerman, J. I. Hemminger and others, of that place.

Louisville, Ky.—A new garage and salesroom has been opened by the Urwick Motor Car Co. at Brook street and Broadway. It is agent for the Marmon and the Baker electric.

Boston, Mass.—Secretary L. M. Snow, of the Bay State A. A., has taken a position with the United Manufacturers and will represent the line of Jones products in Greater Boston.

Philadelphia, Pa.—The Colonial Motor Co., of 330 North Broad street, has undergone a change and now consists solely of James W. Slemons as manager, with R. N. Abbott as assistant manager.

Minneapolis, Minn.—The Colby Motor Co., of Mason City, Ia., has opened a branch store in Minneapolis, located at 1100 Hennepin avenue. All the northwestern territory will be handled from these quarters.

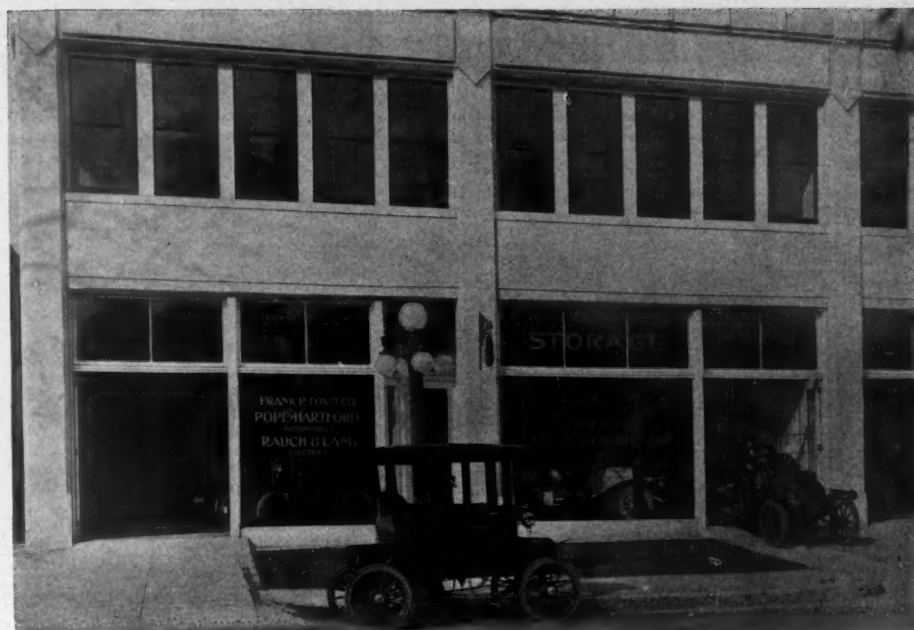
Montreal—The Stockwell Motor Car Co., of Montreal, has moved into new quarters at St. Catherine and Bishop streets, where it has 10,000 square feet of floor space. handles the Oldsmobile, Reo, Maxwell, Lozier and Gramm.

Wilmington, Del.—Young & Loose, trading under the name of the Auto Sales Co., have established themselves at 306 Washington street, and have taken the agency for the Brush. In addition to this they make a specialty of second-hand cars.

Spokane, Wash.—E. A. McGoldrick, of the Empire garage, East 1519 Sprague avenue, has secured the eastern Washington agency for the Avery commercial vehicle and expects to secure the agency for the Glide. His new brick garage and salesroom on East Sprague avenue has been completed.

Trenton, N. J.—The garage formerly known as the American, on South Clinton avenue, opposite the Clinton street depot, will be opened within a few days under new management. The Packard Automobile Mfg. Co. has rented the entire ground floor as a sale and showroom. A complete line of Packard cars will be in stock April 1.

Kansas City, Mo.—The Midland Auto Co. has been organized and will be incorporated under the laws of the state of Missouri, with a paid up capital of \$10,000. Charles A. Emerson will be president and general manager of the company, which will locate at 1625 Grand avenue. It will handle Midland cars exclusively in the Kansas City territory. Carl J. Simons, district representative for the company, having charge of the states of Missouri, Kan-



ESTABLISHMENT OF THE FRANK P. FOX CO. IN INDIANAPOLIS

sas and Oklahoma, will have his headquarters with the local company.

Spokane, Wash.—The L. D. Hewitt Auto Co., Spokane, have opened a branch garage at 1729 Broadway, being the first branch to be established in that city.

New York—J. E. Schaefer of Detroit has joined the Emil Grossman Co. and will superintend the manufacture of Red Head spark plugs, which hereafter will be made on the company's own premises at 250 West Fifty-fourth street. Mr. Schaefer will be general factory manager.

Minneapolis, Minn.—The contract for the new Kissel building in Minneapolis at Thirteenth street and Hennepin avenue was awarded last week and work will begin on the structure soon. It will be 71 by 184 feet in dimensions and will be two stories high with basement. The show

room will be 71 by 60 feet, with the entire front of solid glass.

Boston, Mass.—The Lenox Motor Car Co. has secured quarters in the motor mart for salesrooms. This car is made in Boston.

Boston, Mass.—F. N. Phelps has taken the agency for the Baker commercial vehicles and he is marketing them from 17 Harvard street.

Antigo, Wis.—Raymond Reed and Elra Purson have opened a garage and repair shop at Superior street and Sixth avenue, under the style of Reed & Purdon.

Columbus, O.—The Goodyear Tire and Rubber Co. has opened a distributing agency for its product, located at Gay and Fourth streets. R. A. White is in charge of the branch.

Boston, Mass.—W. C. Wiggins, of Ware, Mass., who has taken on the Parry car, has secured salesrooms in Copley square in the store formerly occupied by the Waite-Robbins company.

Cincinnati, O.—The Blair Motor Co. has been incorporated with an authorized capital of \$25,000 to manufacture and sell motor trucks of all kinds. Incorporators are: John A. Deasy, P. F. Habercorn, John H. Monahan, J. W. Creaman and Edward H. Bourk.

Columbus, O.—The Columbus Auto Brass Co., located at 181-187 Maple street, has increased its plant by adding several new departments. One of the departments which has proven quite a success is the manufacture of radiators and the manufacture of parts.

New York—Howard S. Hamilton has been appointed United States sales manager for the Panhard. Two years ago Mr. Hamilton made a tour of the world in the car as the representative of the factory. Mr. Hamilton headquarters will be in New York city.

Recent Incorporations

New York—Ridgewood Auto Co., capital stock \$10,000; to deal in motor cars; incorporators, W. Van Emburgh, A. Van Emburgh and St. Clair Anderson.

New York—Front Drive Automobile Co., capital stock \$50,000; to manufacture motor cars, etc.; incorporators, J. F. Denison, F. E. Gollier and H. Roth.

New York—Percy Ford Automobile Supply Co., capital stock \$15,000; to deal in motor car supplies; incorporator, R. Litchfield.

Trenton, N. J.—Auto Machine Co., capital stock \$125,000; to manufacture motor cars, motor cycles, etc.; incorporators, T. C. Wheaton, Ivan Shull and H. A. Gray.

Scranton, Pa.—Prescott Adamson Co., capital stock \$10,000; to deal in motor cars.

Hartford, Conn.—Park City Motor Car Co., capital stock \$50,000; to manufacture motor cars; incorporators, F. H. Macfarlane, P. S. Chapman and S. A. Foulds.

Cleveland, Ohio—Cleveland Auto Cycle Co., capital stock \$10,000; incorporators, R. A. Baskin, H. C. Cable, E. P. Rudolph, H. H. Wilcoxen, E. M. Crawford.

Cheyenne, Wyo.—Capitol Garage Co., capital stock \$10,000; general motor car business.

Fort Worth, Tex.—Wichita Falls Motor Co., capital stock \$160,000; incorporators, J. A. Kemp, J. C. Ward and Frank Kell.

Current Motor Car Patents

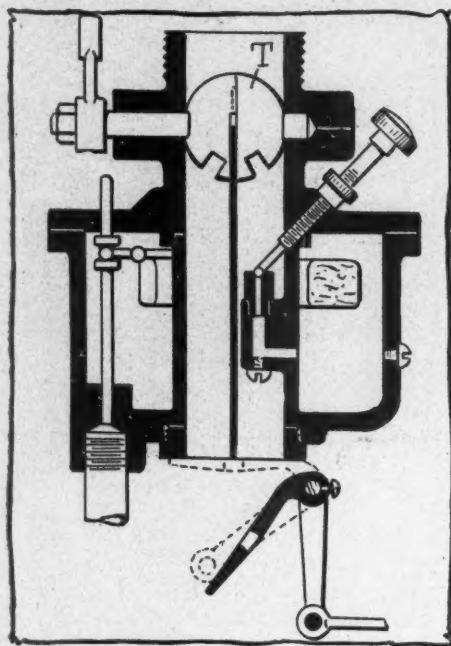


FIG. 1—TWO-PASSAGE CARBURETER

TWO-PASSAGE Carbureter—No. 985,431, dated February 28; to J. A. McHardy, and C. A. Potter, Providence, R. I.—In this carbureter, Fig. 1, the main air passage is divided by a partition, the passage at one side being for air alone, and that at the other side containing the spraying nozzle and also allowing for the passage of air. Controlling the top of this is a butterfly throttle T, which controls both passages simultaneously. That part of the throttle located in the passage containing the nozzle has a checking barrier which reduces the area of the passage, making it less than that of the air passage on the other side of the partition. This reduction takes place as the valve approaches its open position. The object of this arrangement is the proper regulating of the flow of gasoline from the nozzle for different motor speeds.

Lock Nut—No. 986,255, dated March 7; to W. A. Whitney, Rockford, Ill.—Formed integrally with an ordinary hexagon nut at its outer end is a disk or washer piece. Formed in this disk are several radial slots, forming tongue-like projections at the center. These tongues are bent laterally out of plane of the disk and are twisted so that their pointed ends lie at an angle with the threads of the bolt and when the bolt is threaded on these points engage with the threads.

Clutch Shock Absorber—No. 986,082, dated March 7; to L. A. Peckham, Edge-wood, R. I.—The friction factors in this shock absorber are a rotatable drum, contacting with the outside of which is a band with an arm for attachment to the

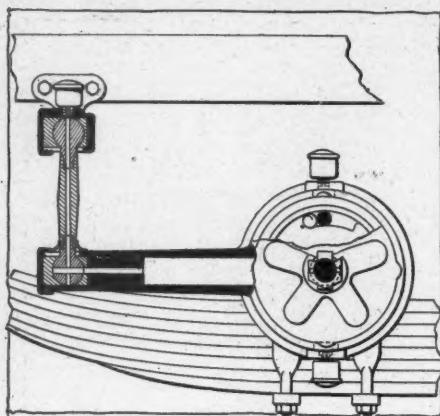


FIG. 2—CLUTCH SHOCK ABSORBER.

frame of a car, the drum being anchored to the spring. Incorporated in the drum is a clutch device, permitting the drum to turn only as the body lowers together with means for causing gradually decreasing frictional resistance on the drum as the body rises.

Combination Front Spring—No. 086,169, dated March 7; to L. Hayes, Monongahela, Pa.—This patent consists of a quarter-elliptic spring, operating in conjunction with the semi-elliptic. The semi-elliptic fastens by an eye bolt to the front end of the front and is shackled at its rear. The quarter-elliptic rigidly attaches to the frame directly above the axle and is pivotly connected to the shortened top leaf of the semi-elliptic at a point midway between the axle and the front end of the frame.

Tappet Rod Construction—No. 986,175, dated March 7; to G. H. Jones, Aldan, Pa.—This valve actuating mechanism consists of a reciprocating sleeve S operating in a tubular bearing T. There is a spring S1 to hold the sleeve S against the cam. A tappet rod R is rounded at its lower end and rides in the sleeve and carries an adjusting nut N at its upper end. There is a spring N1 constantly tending to hold the nut N against the lower end of the valve stem V, which valve stem is rounded and rides in a cup-shaped

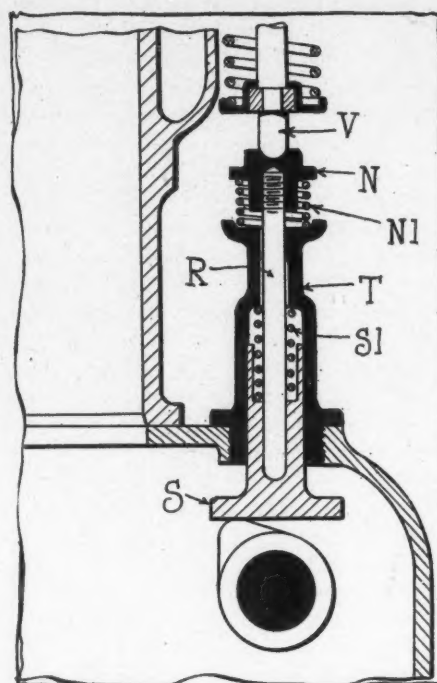


FIG. 3—ADJUSTABLE PUSH ROD

cavity on the upper end of the nut N. This construction apparently gives flexibility, which would prevent breakage in case of binding.

Gear-Shift Mechanism—No. 984,565, dated Feb. 21; to M. L. Jenkins, Harvey, Ill.—This patent refers to the shifting mechanisms of a selective gearset, in which the two sliding units are on the mainshaft of the set. Paralleling this mainshaft are two or more guide rods, each provided with a shifting sleeve, each sleeve engaging its respective sliding gear.

Door Lock—No. 985,433, dated February 28; to H. M. Mink, Kenosha, Wis.—This door lock consists of a catch secured to a door casing and a latch pivoted in the door, one end of the latch projecting therefrom to engage with the catch in the casing. Beneath the latch is an oscillating cam, the shaft which carries it having the door handle at one end and a short lever at the other or inner end.

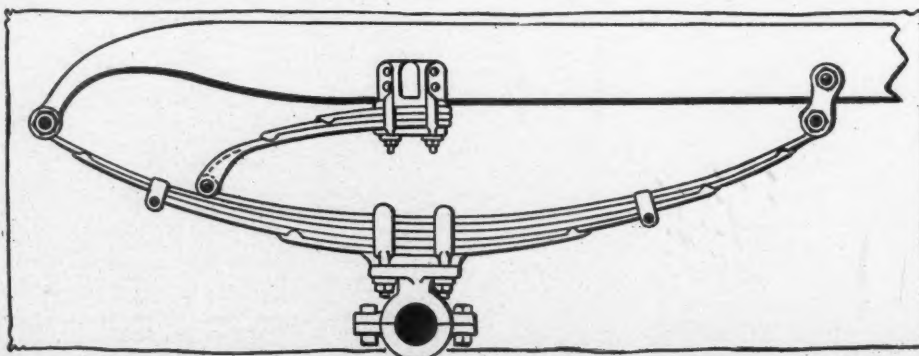


FIG. 4—COMBINATION FRONT MOTOR CAR SPRING